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No. XI. OF VOL. II., 1932. LONDON, SATURDAY, SEPTEMBER 10, 1932 Pp. 120 — Price 1s.
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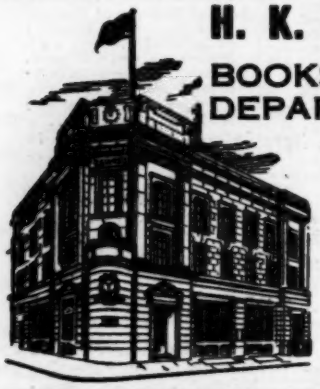

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SURGEON TO THE NATIONAL HOSPITAL, QUEEN-SQUARE

(*Concluded from p. 504.*)

Cerebellar Tumours

IN childhood cerebellar tumours are about twice as common as those in the cerebrum. In the first hemidecade, 70 per cent. of all tumours are subtentorial; between 10 and 15 years of age, the supratentorial and infratentorial are equal in number; between 40 and 45, only about 18 per cent. are cerebellar; while after the age of 55, cerebellar tumours, excluding those of the acoustic nerve, are practically unknown.

These tumours are usually median in situation, at any rate primarily, and bulge into the fourth ventricle from above. From the midline they spread in time lateralward, into one or other of the cerebellar hemispheres. Some are visible on the surface, while others lie beneath it. They may be solid, hard, or soft cellular tumours, or largely cystic.

Medulloblastoma

Medulloblastoma is the common type of midcerebellar tumour of childhood. "This term indicates that the cells represent an embryonic stage earlier than either the spongioblast or neuroblast" (Bailey). They are composed of very embryonic undifferentiated cells of neuro-epithelial origin, and grow with extreme rapidity. That the medulloblastomata take their origin from an embryonic "rest" is made probable by the facts that their cells are of a germinal and undifferentiated type, normally found only in the embryo, their occurrence so early in life, their median position, and their occasional appearance in twins. They seem to be about three times more common in males than in females.

It is fortunate that they are not common tumours, for they are highly malignant, and are prone to widespread dissemination in the cerebro-spinal spaces. Being median in position, they lie over the fourth ventricle, from the posterior part of the roof of which they usually take origin, and project into the centre of the cerebellum. The tumour tends to mould itself into the distended aqueduct of Sylvius, and by its occlusion gives rise to a well-marked internal hydrocephalus. While in the great majority of cases the floor of the fourth ventricle remains free from invasion by the growth, in some cases the tumour appears to be adherent to it, either by extension through the tela or by metastatic implantation. Because of its seat of origin, the tumour inevitably deforms and distends the ventricle, and frequently projects down for some distance through the foramen magnum into the spinal canal.

The histories of these cases have a striking resemblance to one another. The inaugural symptoms are early morning attacks of vomiting without any preceding nausea ("les troubles pseudo-digestifs initiaux des tumeurs de la fosse postérieure" of French neurologists), which may precede the onset of any neurological signs by many months. Hence the almost invariable history of a previous appendicectomy in these cases. Eventually there are associated with these attacks headaches or suboccipital discomfort, due to a commencing hydrocephalus with increased intracranial pressure. These attacks may be intermittent at first, suggesting the re-establishment from time to time of a normal circulation through the iter. The head enlarges from separation at the cranial sutures, thus compensating for the increased pressure. Sooner or later the child becomes clumsy and falls more easily, and its gait becomes uncertain. Frequently a diplopia develops, and examination of the eyes reveals a papilloedema.

The final picture is pathognomonic: a young child with an enlarged head giving a cracked-pot percussion note, a cerebellar gait with ataxia more marked in the trunk and legs than in the arms, hypotonia, and suboccipital tenderness with, perhaps, slight retraction of the head. The extremities are usually equally involved, unilateral predominance of symptoms being unusual. Many of these children show a tendency to fall backwards. Nystagmus, more frequently than in other cerebellar lesions, is very often absent. Occasionally, these children suffer from Jacksonian cerebellar fits, in which retraction of the head and arching of the back are associated with flexion and supination of the elbows and rigid extension of the legs and pointing of the toes.

Out of 131 histologically verified gliomas at the Neurological Institute of New York, nearly 13 per cent. showed calcification visible on X ray examination. Of the 25 medulloblastomas in this group, visible calcification was present in three cases (12 per cent.). Radiography will often show absorption of the posterior clinoid processes, a result common to all posterior fossa lesions which cause a block with dilatation of the third ventricle. There may even be pituitary dysfunction from pressure on the pituitary body.

Lumbar puncture should never be performed in these cases, and if ventriculography be resorted to, it should be by direct ventricular tap and not by encephalography. But even this may facilitate the dissemination of the growth in the cerebro-spinal spaces giving rise to the condition commonly known as "sarcomatosis of the meninges." The same thing may result from the manipulation of the tumour at operation, the neoplastic cells being scattered into the cerebro-spinal spaces, falling by gravity into the spinal canal or being carried upward by the current of fluid over the base of the brain, where they grow as implantation metastases.

When exposed at operation, the medulloblastomata are found usually to be soft, sometimes almost diffluent, comparatively non-vascular tumours which can be readily drawn up in a suction apparatus. This condition is due to the cellular elements predominating over the fibrillary in the make-up of the tumour. With an increase of the interstitial tissue, however, the tumour may be firm enough to allow of its being handled at operation. The presence of visible disseminated growths in the pia-arachnoid is unmistakable evidence that the parent tumour is a glioma. The temptation to attempt their removal is increased by their appearance of being fairly tough, encapsulated, and therefore easily handled tumours, which are usually not attached to the floor of the fourth ventricle. But all surgeons who have had experience of the hopelessness of such removal, utter a warning against falling to this temptation. As may be gathered from their cytology, the prognosis in medulloblastomas is ultimately hopeless.

* Based on lectures given at the hospital.

Decompression with subsequent radiation, to which they appear particularly susceptible, is at present our sole therapeutic resource. Radiation without a previous decompression is fraught with the greatest danger, on account of the consecutive swelling of the lesion so dangerously placed. Even a preliminary decompression will not always obviate such dangerous symptoms. Though the growth of these tumours may be checked for a considerable time by radiotherapy, yet a fatal result has followed in every case. Bailey thinks that over-radiation may be the cause of the progression of symptoms by transformation of the tumour into scar tissue, with a resultant disturbance of circulation within the nervous system. He therefore raises the question whether it would not be better to radiate thoroughly the entire cerebro-spinal axis immediately after operation and then stop.

Astrocytoma

This is another mid-cerebellar tumour of childhood, but unlike the medulloblastoma and the angioblastoma, is not confined to this situation. They appear to be almost as common as scattered cerebral lesions. An additional form, found in the cerebrum only, is a highly malignant, invasive tumour, occurring almost exclusively in adults, with a very grave prognosis.

The age of onset of the cerebellar astrocytomas is approximately the same as for the medulloblastomas, though, on account of the insidious progress of the former, it is difficult to arrive at a precise time of their earliest appearance. The sexes are equally affected.

As in the medulloblastomas, the chronology of symptoms in the astrocytomas is very similar in all cases. But the former are marked by their rapid and continuous progress as contrasted with the slower development and often symptomatic remissions of the latter. These intervals of comparative freedom from symptoms and their longer course at once distinguish the astrocytomas from the medulloblastomas.

The astrocytoma is a mixed tumour, composed of varying proportions of fibrillary and protoplasmic astrocytes, with a varying consistency in accordance with the predominating type of cell. They may be either solid tumours, or largely cystic. But even in the former some evidence of cyst formation, either on the surface or in its substance, is nearly always found. When predominately cystic, they appear as a large xanthochromic cyst with a definite firm tumour of low vascularity in its wall. These mural tumours vary greatly in size. The fluid of the cyst, which clots rapidly on removal, is due to capillary transudation from the tumour. The occurrence of spotty calcification in some of the astrocytomas may sometimes be detected by X rays (20·6 per cent.).

The symptoms usually begin in an apparently healthy child with early morning headaches, accompanied by vomiting. This may continue for some time and in spite of it the child is able to lead a normal life. Remissions of weeks or months occur, followed by the return of these symptoms, but usually in an aggravated form. The headaches are made worse by coughing, crying, or straining at stool. Thus the child tends to become constipated. It is then noticed that the child is clumsy in handling its toys, and is unsteady on its feet. About this time the parents notice that the head has grown larger more rapidly than it should. With this enlargement of the head, due to separation at the sutures from the pressure of the hydrocephalus, the headaches and vomiting may disappear entirely. Then, probably at school, it is discovered that the child's sight is getting poor. On examination, however, no measurable swelling of the discs may be found, owing to the decompressive effects of the separation of the sutures. Cushing emphasises the fact "that a large, mesially placed and slowly growing tumour of the fourth ventricle may elicit no localising symptoms whatever, should the pressure effects of the hydrocephalus be eliminated."

When well developed, the symptomatology is that of a mid-cerebellar tumour, which has been already detailed in the previous section.

Ependymoma

No attempt will be made to separate the ependymomas from the ependymoblastomas, though, according to Bailey and Cushing, the former are "somewhat more highly differentiated," and appear at a later age than the ependymoblastomas.† They originate from ependymal cells and more or less closely reproduce their structure. They arise either from the ependymal floor of the fourth ventricle, to which they are firmly attached, or from the posterior medullary velum. According to Bailey, they can always be recognised microscopically by the blephroplastin of the cells, which apparently occurs in no other tumours, except the pinealomas.

Like the medulloblastomas, the larger number of them occur in the mid-cerebellar region in close proximity to the fourth ventricle. They are usually described as pale, nodular, and firm, thus contrasting with the soft reddish appearance of the former. They are prone to calcium deposition and cyst formation, though these changes would appear to be more characteristic of cerebral than of cerebellar ependymomas. They are usually slow growing and relatively benign tumours, which have an even greater tendency than the medulloblastomas to project downward within the posterior cistern into the spinal canal.

The inaugural symptoms are usually headaches, with nausea and vomiting of a pronounced character. These are apt to come on abruptly, due probably to an obstructive hydrocephalus. A period of some months then often intervenes, followed by occipital pain and the usual evidences of cerebellar involvement.

Papilloma of the Choroid Plexus

The majority of these tumours are described as being growths, continuous with the choroid plexus, which they closely resemble in structure. They may occur as a simple cauliflower-like papilloma with a villous exterior, or as a definitely encapsuled tumour with a smooth, highly vascularised surface. Some, usually those occurring in the lateral ventricles, may be characterised by an accompanying cystic formation.

They are benign in nature, lacking invasive tendencies, and do not infiltrate the adjacent brain tissue. Their papillæ occasionally push their way for a short distance into the brain tissue or between the leaflets of the cerebellar cortex. Moreover, true "seeding" may occasionally take place through the medium of the cerebro-spinal fluid and metastases be set up in this way.

They have a special predilection for the fourth ventricle, in which 50 per cent. of those reported have been found. The lateral ventricles have housed 34·7 per cent., of which 93 per cent. were on the left side; and the third ventricle, 17·3 per cent. The greatest age-incidence is the first decade, gradually diminishing up to the sixth decade.

† Cushing and Bailey no longer regard this differentiation as essential.

Those arising in the fourth ventricle grow outward and backward, compressing the cerebellum and producing an internal hydrocephalus by blocking the aqueduct of Sylvius (Fig. 7). It has been suggested that a considerable part of the non-obstructive hydrocephalus found with tumours of the choroid plexus may be associated with the increased epithelial surface.

The papillomas of the fourth ventricle give rise to the usual symptom-complex of mid-cerebellar tumours. But as at first, they give rise merely to symptoms associated with an increased intracranial tension due to internal hydrocephalus, without localising signs, and often without papilloedema, or with only a slight degree of swelling ventriculography is especially useful. The symmetrical dilatation of the lateral ventricles and the filling of the third ventricle place the obstructive lesion in the aqueduct of Sylvius. When originating in the lateral recess of the fourth ventricle, however, they may give rise to symptoms simulating those of an "angle" tumour.

It has been found that radiation of these tumours has a marked effect in reducing their size and vascularity, thus enabling them to be removed more easily and with a greater safety at the second stage of an operation.

Dermoids

Of the 39 intracranial dermoids reported in the literature, 15 were situated in the posterior cranial fossa, 13 being in the midline and 2 in the right cerebellar hemisphere. They are encapsulated tumours, varying in size from a pea to a tangerine orange; oval, round, or hour-glass in shape; soft or even cystic; with an opaque yellow colour. Like the epidermoids they may have a pearly sheen. Their contents consist of sebaceous material, fat, cholesterol crystals in varying amounts, and always hair (Fig. 8). The presence of hair may be regarded as pathognomonic of a dermoid or teratoid tumour. If infected the contents will consist of purulent matter.

FIG. 7

Papilloma of choroid plexus, fourth ventricle. (Museum, London Hospital.)

Microscopically the tissue is seen to consist of three layers: a fibrous outer layer, a connective tissue stroma, and an inner epithelial layer. In the case of pial dermoids, the outer layer is continuous with the pia mater, which is thickened, and is continuous with the connective tissue stroma. Blood-vessels enter the tumour from the pia, and may form a vascular layer between the pia and the connective tissue layer. Boestrom lays stress upon the importance of the pia in the nutrition and growth of the anlage. Calcification and bony or cartilaginous spicules may occur in the connective tissue stroma, and be revealed by X ray examination.

FIG. 8

Dermoid cyst of the cerebellum. (Museum, Royal College of Surgeons of England.)

Intracranial dermoids are found at all ages, but the majority of the 39 reported cases have been in the first three decades (11, 5, 9). The sexes appear to be about equally affected. The tumour was single in 33 cases and multiple in 6. It was pial in type in 25 cases. Unlike the epidermoids the dermoids are never found in the cerebello-pontine angle. While other congenital anomalies are rare in association with the epidermoids, they are frequent with dermoids.

Unless the presence of such congenital anomalies arouses one's suspicions, it is not possible to make a pre-operative diagnosis of the presence of a dermoid from the neurological findings alone. Calcification in a tumour as shown by the X rays should lead one to keep in mind the possibility of its being a dermoid, especially if there is a bony defect over or connected with the area of the calcification.

Angiomatous Malformations

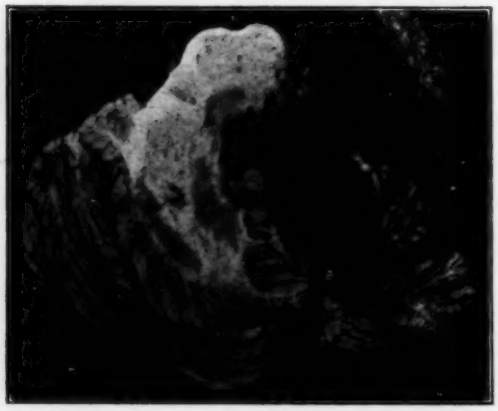
Under the head of vascular malformations are included three types of lesions: (1) the telangiectases; (2) the venous angiomas; (3) the arterial or arterio-venous angiomas.

The *telangiectases* are small, mainly capillary lesions, which do not give rise usually to any clinical symptoms. According to Virchow the floor of the fourth ventricle is a favourite site for them, and in cases reported they are commonest in the upper part of the pons. They are not always confined to the pons, however, but may be multiple in the cerebro-spinal nervous system. Whether these telangiectases are capable of developing into the other two forms is not known.

The *venous angiomas* are divided by Cushing and Bailey into three anatomical varieties: the simple varices, the serpentine varices, and the racemose or cirsoid type. Any of them may give rise to symptoms suggestive of tumour, epilepsy being the commonest result of the lesion. They are usually unaccompanied by papilloedema, though this has been present

in some cases. Congenital nævi of the face may be associated with venous angiomas, though never with the arterial, and may justify their diagnosis in the

FIG. 9



Venous angioma of cerebellum. (Museum, National Hospital.)

presence of a contralateral Jacksonian epilepsy or cerebral palsy.

Although symptoms usually appear late in life, nevertheless most authorities consider them congenital in origin. Any direct operative attack upon these angiomas is fraught with great risk from hæmorrhage or serious cortical damage. They are better left severely alone. Radiation through a decompression opening offers some chance of amelioration, but the results are not invariably encouraging (Figs. 9 and 10).

To the angiomatous malformations, in which arteriovenous anastomoses have occurred, Cushing and Bailey have given the name of *angioma arteriale*. They describe the lesion as follows:—

> "The central portion of the lesion is a fairly well-circumscribed vascular area, composed of manifold, partly thinned and partly thickened vascular trunks, forming an inextricable coil of dilated and sinuous vessels of varied calibre, through which the arterial blood passes from enlarged entering arteries directly into one or more greatly dilated veins of exit usually with the production of an audible bruit."

It is generally assumed that these lesions have as their basis a congenital malformation of the blood-vessels, which at a later period, usually in young adult life, from some unknown cause takes on increased activity. No cases have been reported in infancy.

They are tumours which invariably lie upon the surface of the brain beneath the arachnoid, but extend into the brain and may even reach in a wedge-shaped formation to the wall of the ventricle. And it is important that the neurological surgeon should bear in mind that some of these arterial angiomas have an extensive vascular connexion through the overlying dura with the meningeal vessels, which may be enormously enlarged.

Arterial angiomas are not common in the cerebellum, only one proven case occurring in Cushing and Bailey's series of 13 cases. This is in marked contrast to the angioblastomas, which have their seat of election almost exclusively in that part of the brain. In the presence of an audible intracranial bruit, associated with increased extracranial vascularity and a non-pulsating unilateral exophthalmos, the pre-operative diagnosis of an angioma arteriale can be made with assurance. But the bruit is a most variable symptom in these cases, in the time of onset, in its intensity, and in its persistence. As in arterio-venous aneurysm of the internal carotid and the cavernous sinus, so too in these cases a bruit may be heard over the globe of a unilateral non-pulsating exophthalmos. And curiously enough the patient may be quite unaware of the presence of a bruit, which only becomes obvious to him after a decompression has been done.

Extracranial increased vascularity—enlarged vessels in the scalp, and increase in size of one or both carotids with marked pulsation in the neck—is a conspicuous symptom in only a very few cases. Whereas papill-œdema is rarely if ever associated with an angioma venosum, it is common with angioma arteriale.

Of all the symptoms associated with the racemose angiomas, the occurrence of epileptiform seizures, often Jacksonian in character, is the most uniform. In fact, certain authors regard their occurrence as essential to the diagnosis of a cerebral angioma. These attacks may occur, with long periods of remission, over a considerable number of years. Because of the absence of an audible bruit and increased extracranial vascularity in the vast majority of cases, a clinical diagnosis of arterial angioma is rarely made. The condition is only discovered either at operation or at autopsy unless calcification has occured in the walls of the tortuous vessels, giving shadows on the radiogram closely resembling diffuse calcification of an atrophic cortex. In 21 cases of venous and arterio-venous malformations reviewed by Weber, calcification was noted in eight instances (Fig. 11). It is, however, usually impossible to differentiate it from the calcification occurring in slowly growing gliomas. The common terminal occurrence in all kinds of cerebral angiomas is the rupture of a vessel, possibly into the ventricle, during an epileptic attack.

FIG. 10

Enlarged bony grooves for the lateral and superior petrosal sinuses associated with the venous angioma in Fig. 9. (Museum, National Hospital.)

Treatment is limited to a decompression followed by radiation. Any direct attack upon the lesion, such as ligation of vessels, is not only usually futile but highly dangerous. These lesions constitute a veritable *noli me tangere* to the surgeon, and should be left severely alone. Definite beneficial results, as regards the pressure symptoms, have followed a decompression operation. If followed by prolonged radiotherapy there is a chance of amelioration or even of cure.

Hæmangioblastoma

The hæmangioblastomas are true neoplasms, arising from the proliferation of angioblastic cells, and are composed of the same elements that enter into the development of the primordial blood channels. They

may form solid capillary or cavernous tumours, according to the arrangement and method of growth of their cells. The familial history (20 per cent.), the presence of more than one tumour of the same kind in a patient, or the association with other abnormalities, indicate their congenital nature. Hence, a vascular *Anlage* in or adjacent to the posterior end of the fourth ventricle is postulated as the source of these tumours.

FIG. 11

Calcification in a cerebral angioma. (X Ray Department, National Hospital.)

In very many of the cases the lesion consists of a large cyst containing xanthochromic fluid, with a nodule or tumour of varying size in its wall (Fig. 12). The fluid of the cyst is due, as in the cystic astrocytomas, to capillary transudation from the tumour. Lindau thinks that the explanation of the cyst formation is probably that, owing to the lack of lymphatic vessels, the nerve tissue cannot get rid of the fluid exuded by the angioma and thus a cyst is formed with walls consisting of compressed glia without an ependyma. Their appearance to the naked eye may be vascular or not. They may be compact encapsulated lesions of a yellow colour, but much more frequently they are cystic. They usually show a sharp line of demarcation between the tumour and the nerve tissue.

These angioblastic tumours are almost exclusively confined to the cerebellum, only a single proven one having been found so far in the cerebrum. Barnard, however, thinks that this rarity is more apparent than real, and is due to the fact that the very intensive study of cerebral tumours is of recent date. In no case have they ever been associated with a nævus in the area of the fifth nerve, as is so often the case with the cerebral angiomatous malformations. Lindau regards the cerebellar tonsils as the seat of election of the tumour nodule found in the hæmangiomatous cysts.

The hæmangioblastomas occur at a much later period of life than do the cerebellar gliomas, which, as has been emphasised already, are tumours of childhood. They seldom give rise to symptoms before the second or third decade, those due to the solid tumours being earlier in appearance than those of the cystic ones. They may be, moreover, but one manifestation of angiomatous formations elsewhere, more particularly in the retina. To this latter combination, associated also with cysts in the pancreas, kidneys, and liver, has been given the name of "Lindau's disease." The true nature of the retinal angiomatosis, however, was first recognised by Treacher Collins in 1894. The moral to be drawn from this association of cerebellar and retinal hæmangiomatosis is that every patient with the symptom-complex of a cerebellar tumour should have the peripheral retina searched for the possible presence of an angioma.

Cushing thinks that the cerebellar angiomatous lesions very probably bear much the same relation to Lindau's disease as acoustic tumours bear to von Recklinghausen's disease. But just as single acoustic tumours are more frequent than those associated with von Recklinghausen's disease, so are the isolated cerebellar cystic hæmangiomas more common than in combination with Lindau's disease.

The symptom-complex of the hæmangiomas does not differ in any marked degree from that produced by other tumours in the same situation. But the chronological order of the symptoms differs somewhat from that of the mid-cerebellar tumours of childhood. Whilst in the latter vomiting is the inaugural and for a long time usually the only symptom, in the hæmangiomas paroxysmal headaches usher in the clinical picture. They occur on waking, and are made worse by stooping, coughing, or sneezing. That they are due to intermittent hydrocephalus is suggested by their intermittency, during which period the patient may be quite well. Vomiting is usually of later occurrence, and is followed, though

FIG. 12

Hæmangioblastoma of cerebellum, showing cyst formation with mural growth. (Museum, National Hospital.)

sometime after, first by symptoms of cerebellar involvement and then by visual disturbances. The long interval, which may run into months, between the onset of the paroxysmal headaches and the appearance of papilloedema is a very striking feature in these cases.

Tuberculoma

Nothing is so striking as the difference of the present-day frequency of tuberculoma, compared with that of twenty-five years ago. For instance, in Starr's statistics (published in 1908), of 300 brain tumours in children, 152 were tuberculomata (50·8 per cent.), of which 69 were in the posterior cranial fossa; while in 300 brain tumours in adults, 41 were tuberculous (13·6 per cent.), of which 19 occurred in the same region. In contrast with these figures, one finds that in the last 1000 verified brain tumours at the National Hospital, only 1 per cent. were tuberculous, and in Cushing's 1398 verified tumours, 26 were of that nature.

All statistics show the greater frequency of tuberculoma in the young—according to Gowers three-quarters of the cases are under 20 years and one-half of them under 10 years—and that their seat of election is in the posterior cranial fossa. Further, nearly all writers on the subject lay stress on the fact that the solitary tubercles of childhood show a marked predilection for the cerebellum and brain stem. This has led van Wagenen to raise the question whether the greater prevalence in young people, and especially of solitary tubercles, may not have something to do with the type of organism concerned in the process, whether bovine or human.

Occurring in the brain, tuberculomata form solid, firm, rounded masses, varying in size from that of a pea to that of a walnut, or even larger (Fig. 13). They do not infiltrate the brain tissue, but cause atrophy of it by pressure. They are mostly well-defined and shell out easily. They are often surrounded by an area of vascular engorgement, but as a rule there is no definite capsule. A capsule of fibroid tissue may

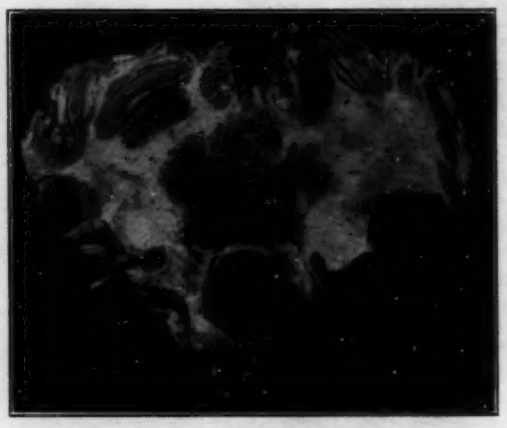
FIG. 13

Solitary tuberculoma of the cerebellum. (Museum, National Hospital.)

be formed around them, however, if the mass ceases to grow or calcification takes place. The large solitary tuberculoma is a peculiar manifestation of tuberculosis in the brain "where the extension of the inflammatory process is allowed to proceed symmetrically, unhampered by planes of fascia or strands of connective tissue" (Boyd). They usually occur without apparent connexion with the membranes, differing in this respect from gummata. When, however, the tumour reaches the pia mater, the latter becomes thickened and often adherent to the dura. Very occasionally they grow from the dura itself.

On section they present a uniform opaque, cheesy appearance, with areas of scattered softening. The

FIG. 14



Metastatic carcinoma of cerebellum, secondary to lung. (Museum, National Hospital.)

periphery is softer, greyish, and translucent, and the surrounding brain is usually softened. They rarely tend to undergo suppuration. Forming thus a well-defined mass, a tuberculoma may be readily mistaken for a true tumour. Frequently there is more than one present, in which case they may occupy the same or different parts of the brain.

Tuberculoma of the brain may occur in the absence of other clinically recognisable tuberculous lesions. Suspicion as to the true nature of the tumour may be aroused by the presence of hereditary tendencies to tuberculosis, a history of exposure to influences favouring its development, a history of symptoms of a primary focus elsewhere in the body, or the presence of local or of general evidence of tuberculous infection.

The problem for the neurological surgeon is not a difficult one. The surgical outlook for ultimate recovery following extirpation is exceedingly poor. With a few notable exceptions, usually in adults, all the cases have succumbed to a tuberculous meningitis at varying intervals following removal. The necessity may arise of giving relief to pressure symptoms, especially when the tuberculoma is situated below the tentorium. If so, one should be content with a wide decompression, relying upon constitutional treatment and heliotherapy to deal with the lesion. But the rarity with which a healed tuberculoma is met with post mortem is an index of the result of such treatment. Finally, it should always be borne in mind that other forms of tumour may occur in tuberculous subjects.

Metastatic Carcinoma

According to Boyd, in from 3 to 5 per cent. of brain tumours the growth is secondary. But as pointed out by Walshe, the frequency of secondary carcinoma in the brain is difficult to estimate, occurring as it does as a terminal phase in visceral carcinoma, when its manifestations are of an indeterminate character, and usually attributed to the effects of the primary

lesion. He thinks, therefore, that its incidence is higher than that usually given. It is only in those cases in which early metastasis produces predominant signs and symptoms in the central nervous system, without any clinical signs pointing to the presence of a primary lesion, that are likely to undergo a full neurological examination. It is in these cases, moreover, that the usefulness of an X ray examination, especially of the chest, is shown by revealing a clinically latent tumour.

The commonest seat of the primary lesion is the breast, lung, kidney, skin, colon, and generative organs, in that order.

The ease with which carcinomatous cells can be carried by the pulmonary veins to the left heart and thence into the general circulation accounts for the frequency of metastases in carcinoma of the lung and bronchus. Dosquet found that of 105 cases of carcinoma of the lungs, the central nervous system was involved in 31·4 per cent. Similar findings have been recorded by Globus and Selinsky and by Ferguson and Rees.

The secondary deposits are usually multiple, varying in size from the macroscopic to the microscopic. The visible ones are sharply defined, rounded tumours, loosely attached to the surrounding brain (Fig. 14). When the involvement of the central nervous system takes on the form of a diffuse meningeal process, it is spoken of as "diffuse sarcomatosis," "gliomatosis," or "carcinomatosis" (carcinomatosis of the meninges or meningitis carcinomatosa), as the case may be. The meninges may be involved without gross involvement of the cerebral substance, the malignant cells infiltrating the pia-arachnoid, but rarely invading the brain. The ependyma of the ventricles may also be covered with similar small secondary growths. Hassin believes that the meninges are involved by way of the perineural lymphatics along the cranial nerves, the source being metastatic cells in the lymph spaces and glands of the neck. The tumour cells spread over the surface of the pia-arachnoid and the nerve sheaths by direct extension. The brain is involved only to a short distance under the surface by infiltration of the carcinoma cells along the perivascular spaces of vessels entering the cortex from the meninges.

According to Morse, the commonest symptoms of carcinomatosis of the meninges have been "headache, vomiting, pain and stiffness of the neck, and psychic disturbances of various kinds followed by a lapse into stupor. In some instances these symptoms developed rapidly at the onset of illness, in others they closed the scene after a variety of earlier manifestations." Moise, however, has come to the conclusion after a review of the literature that the clinical picture is so complicated and confused that the value of differential points in any particular case must be limited. The records, both clinical and post mortem, of Parker's cases also illustrate the great variability in the course and tendencies of the disease and the difficulties in diagnosis. Thus it only emphasises the necessity of a complete general physical examination in every case of disease of the central nervous system.

Parasitic Cysts

These comprise the cysticercus cellulosæ and hydatid cysts.

Cysticercus cellulosæ.—With a greater stringency in the inspection of meat and the gradual disappearance of the *Tænia solium*, these cysts have become less common than formerly. When they are found in the brain it has commonly been in males between 40 and 60 years of age. They usually occur in large numbers scattered on the surface, or in the substance of the brain. They are frequently found swimming free in the ventricles or adhering to the ependyma. They are also found in the arachnoid cisterns at the base of the brain. A single parasite is more uncommon, although out of 72 cases collected by Stern, 53 had a solitary cysticercus of the fourth ventricle. When situated here they may give rise to a marked hydrocephalus by occluding the aqueduct of Sylvius.

The cysticercus in the brain is almost always formed by a capsule which encloses the parasite floating in a clear fluid. Hence they appear when found as a cystic vesicle, either floating free or fixed. Each tumour varies in size from that of a pea to a walnut. The symptoms are protean, and their inconstancy and variability has been explained by the power of movement possessed by the parasite. Convulsions and mental impairment appear to be prominent features of the disease. When occurring in the fourth ventricle it may remain latent until sudden death occurs. On the other hand, it may give rise to occipital headache, vertigo, vomiting, cerebellar ataxia, respiratory and circulatory disturbances, and to glycosuria. The intermittence of these symptoms is very characteristic, the patient being comparatively well between the attacks, and able to carry on his ordinary life. Sudden rotation of the head may bring on vertigo and vomiting, and may cause the patient to fall down. Bruns regards this symptom as pathognomonic of cysticercus in the fourth ventricle.

Except in the presence of cutaneous cysticercus, or definite evidence or possibility of infection, a positive diagnosis is unlikely, unless Brun's symptom can be elicited. Cases, however, are reported in which a diagnosis has been made by lumbar puncture and by puncture of the brain. In cases in which a diagnosis has been made of cysticercus of the fourth ventricle, and where there is no indication that the vesicles are freely mobile, puncture of the fourth ventricle, after the usual suboccipital approach, should be performed.

Hydatid cysts are rare and usually single. They have been found in the cerebellum and in the ventricles. They may run their entire course without giving rise to any symptoms, although, as a rule, symptoms of a tumour are present, and a diagnosis of such a lesion is made. The finding of the hooklets and an excess of sodium chloride in the cerebro-spinal fluid on lumbar puncture may lead to a definite diagnosis of hydatid. A local thinning of the skull, due to erosion of the bone by the echinococcus, may be revealed by X rays.

I am greatly indebted to Dr. J. G. Greenfield for his help and advice regarding the pathological specimens illustrated.

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AN AGGLUTINATION REACTION IN VARIOLA

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A METHOD of obtaining pure suspensions in saline of the elementary bodies of vaccinia (Paschen bodies) has recently been described by Ledingham (1931). Such suspensions are readily agglutinated by anti-vaccinal sera, and it has been possible with the aid of this new technique to study the development of agglutinins for elementary bodies in animals infected with the virus of vaccinia (Ledingham, 1932).

An obvious extension of this work was the investigation of variola on similar lines, in the expectation that light might thereby be thrown on many still obscure problems concerning the interrelationships of the various pock viruses. The following brief communication contains a record of certain basic data which have been obtained from a study of the development in the sera of variolous patients of agglutinins for the elementary bodies of variola.

SOURCES OF MATERIAL AND TECHNICAL METHODS EMPLOYED

A supply of virulent material (crusts and seropus) from severe cases of small-pox was obtained through the courtesy of Prof. H. W. Acton, of the School of Tropical Medicine and Hygiene, Calcutta. Similar material from mild cases of small-pox (alastrim) was obtained from patients at the Long Reach Hospital, Dartford, through the kind permission of the medical superintendent, Dr. A. F. Cameron.

Variola major.—A 1 in 100 saline suspension of the Calcutta variola scabs was inoculated by scarification of the skin of a *rhesus* monkey. Unfortunately this material proved to be of low virulence, resulting only in the production of a few small papules. These were lightly scraped on the fourth day of infection. The pulp so obtained was insufficient for the preparation of an elementary body suspension and was, therefore, used to infect a rabbit, the pulp being ground up in saline and the supernatant fluid obtained by lightly centrifuging this suspension being injected intradermally into the shaved skin of the back. Four days later each site of inoculation was marked by a red, much elevated papule, 5 to 7 mm. in diameter, with a yellow necrotic centre. The animal was then killed and the papules were excised with aseptic precautions. The tissue removed was cut up very finely with scissors and ground thoroughly in a mortar with distilled water. The resulting suspension was placed in a separating funnel with an equal volume of ether in order to extract all the fatty materials, the mixture being shaken at frequent intervals. At the end of 24 hours the lower aqueous layer was drawn off and then centrifuged for two hours at an approximate speed of 6000 revolutions per minute. The sediment so obtained was resuspended in distilled water and again subjected to rapid centrifugation for two hours. Finally the sediment was suspended in 0·25 per cent. formalin in normal saline, and centrifuged at a relatively low speed until all debris had been precipitated. Smear preparations of the supernatant fluid showed large numbers of elementary bodies with practically no other formed elements.

Variola minor.—The English variola material, being fresh, produced a more satisfactory reaction when inoculated upon the skin of a monkey, and the amount of pulp obtained was sufficient for the preparation of an elementary body suspension directly from the monkey tissue. Owing, however, to the hæmorrhagic nature of the lesions it was found necessary to repeat the process of rapid centrifugation four times before a pure suspension could be obtained. A rabbit was also inoculated intradermally with a suspension of the same monkey pulp. The reaction produced was not so marked as that obtained with the Calcutta strain of virus, but a satisfactory suspension was eventually obtained from material excised on the fourth day of infection.

Preliminary tests showed that these three elementary body suspensions, one obtained from the

Indian strain of virus, and two from the English strain, were agglutinated in characteristic fashion by a known anti-variola monkey serum. Owing possibly to its larger content of elementary bodies, clumping was more definite in the suspension obtained from the Indian strain and the agglutination titre was slightly higher than that given by the other suspensions. A microscopic agglutination technique was used in all the tests, the results being read under a two-third inch objective after incubation at room temperature (average 65° F.) for 24 and 48 hours.

AGGLUTININ PRODUCTION IN MAN

The agglutination test as above described was carried out on sera from ten cases of severe small-pox in Calcutta and on 28 sera from patients at the Long Research Hospital, Dartford, who were suffering from the mild type of small-pox (variola minor or alastrim) prevalent in England. The results are given in Tables I. and II.

TABLE I.—*Calcutta Small-pox Sera*

Case No.	Duration of infection.	Agglutinin-titre versus—			Clinical notes.
		Indian variola E.B.S.	English variola E.B.S.	Vaccinia E.B.S.	
1	19 days	N	N	N	Confluent eruption.
2	19 ,,	N	N	N	Mild.
3	16 ,,	16+	16+	N	Mild.
4	16 ,,	16+	8 tr.	N	Semiconfluent.
6	18 ,,	N	N	N	Mild.
7	11 ,,	N	N	N	Confluent.
	16 ,,	8+	8 tr.	N	
8	7 ,,	N	N	N	Confluent.
	12 ,,	N	N	N	
9	11 ,,	N	N	N	Mild.
10	13 ,,	N	N	N	Confluent.
11	10 ,,	8++	8 tr.	N	Confluent.

Abbreviations in Tables.—N = no agglutination in dilution of 1 in 4 or higher. ++ = marked agglutination. + = definite agglutination. tr. = trace of agglutination. E.B.S. = elementary body suspension. All readings were taken after 48 hours' incubation.

TABLE II.—*Dartford Small-pox Sera*

Case No.	Duration of infection.	Agglutinin-titre versus—			Case No.	Duration of infection.	Agglutinin-titre versus—		
		Indian variola E.B.S.	English variola E.B.S.	Vaccinia E.B.S.			Indian variola E.B.S.	English variola E.B.S.	Vaccinia E.B.S.
	days					days			
1	23	32+	N.t.	N	15	12	16+	16+	N
2	12	64+	,,	32+	16	12	16+	16+	N
3	12	8+	,,	N	17	8	16+	4+	N
4	19	N	,,	N	18	6	32+	8+	N
5	13	32+	,,	N	19	15	N	N	N
6	16	4 tr.	,,	32+	20	8	N	N	N
7	23	4 tr.	,,	N	21	6	N	N	N
8	7	4 tr.	,,	N	22	13	4+	4 tr.	N
9	16	16+	,,	N	23	6	8+	4 tr.	N
10	13	16+	,,	N	24	7	8+	4 tr.	N
11	10	4+	,,	N	25	21	32+	8+	N
12	10	16+	,,	N	26	8	N	N	N
13	8	8+	,,	N	27	6	N	N	N
14	17	32+	,,	N	28	8	8+	N.t.	N

N.t. = not tested.

In the case of the Calcutta sera it must be noted that the specimens were necessarily over a month old before they could be tested. It is probable that a larger number of these would have given positive results had they been fresh. The sera from the Dartford cases were stored in the cold room soon after collection and were tested not later than three days afterwards.

From the results shown in Tables I. and II. it appears that the development of immunity to the virus of variola, both in its classical form and in the mild form prevalent in England, is accompanied by the production of agglutinins which are specific for the variola elementary body. Suspensions of the elementary bodies of vaccinia are not agglutinated by the small-pox antisera. The agglutinins for variola elementary bodies do not reach high titres, but it is possible that further refinements in technique may yield suspensions of higher agglutinability.

A further fact of considerable interest was disclosed by the results of tests carried out on the blood of a few individuals who were exposed to infection with variola, but who were immune to it by reason of previous vaccination. Samples of blood were taken from a medical officer and a nursing sister at the Long Reach Hospital and from a laboratory attendant at the Lister Institute, who was responsible for feeding the variolated monkeys used in this investigation. All three had been vaccinated several times. Agglutinins for both variola and vaccinia were found in the serum obtained from the sister and from the laboratory attendant, but none were found in the blood of the medical officer.

Some months before commencing to work with variola virus I was revaccinated and samples of my blood were taken at regular intervals in order to study the agglutinin response. No agglutinins for vaccinia were present previous to vaccination. The agglutinin-titre for the Paschen body suspension rapidly rose, reaching a maximum of 1 in 160 on the seventh day of infection. Thereafter the titre slowly fell, reaching 1 in 4 on the 52nd day after vaccination. Later I was exposed to infection both from handling the variolated monkeys and from the small-pox patients isolated at Dartford. Three weeks after commencing the work on variola my blood gave a positive agglutination response with the variola suspension to a titre of 1 in 64 and with the vaccinia suspension to a titre of 1 in 128.

AGGLUTININ PRODUCTION IN ANIMALS

The inoculation of either the Indian or the English strain of variola virus into monkeys resulted in the production of agglutinins for the variola elementary body but not for the vaccinia elementary body. Rabbits infected with pulp obtained from these monkeys produced, however, agglutinins for both variola and vaccinia. A more detailed description of these experiments will be withheld until the results of further work with hyperimmune sera are available.

DISCUSSION

The experiments described, though by no means exhaustive, demonstrate that agglutinins specific for the elementary body of variola are produced in response to infection of man or monkey with this virus.

The fact that vaccinia elementary bodies are not agglutinated by the sera of variolous patients furnishes a striking difference between the agglutination test and the vaccinia-variola flocculation reaction so carefully studied by Craigie and Tulloch (1931). In the latter reaction, it will be remembered, a serum from a rabbit hyperimmunised with vaccinia virus is brought in contact with an antigen which consists of a saline extract of variola crusts. Craigie (1932) has recently shown that the flocculable substance in this antigen will pass through a Seitz E.K. filter which is capable of holding back the elementary body, thus proving conclusively that the flocculation test is essentially a precipitin reaction. It would seem likely, therefore, that vaccinia and variola share some common antigen, although separate agglutinins are

produced in the body in response to these two viruses.

Further work now in progress is designed to throw light on these serological affinities and their bearing on problems of active immunity among the pock viruses.

SUMMARY

1. A method is described for obtaining a pure suspension in saline of the elementary bodies of variola.

2. Variola elementary body suspensions are agglutinated by the serum of patients convalescent from either the mild or severe type of small-pox, but vaccinia elementary bodies are not agglutinated even in the highest concentrations of such sera.

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SOME FACTORS TO BE TAKEN INTO ACCOUNT IN THE TREATMENT OF HYPERTONY

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RECENTLY C. L. G. Pratt and I have shown [1] that the administration of certain drugs for the purpose of reducing pressure in cases of hypertony results in a disturbance of the equilibrium of the different blood constituents. Patients with hypertony whose pressure was reduced artificially showed an increase of blood-urea and non-protein nitrogen; the water-excretion function was depressed, the alkali reserve of the blood diminished, and the cardiac reserve power lessened. These facts suggest that the indiscriminate use of pressure-reducing drugs is extremely undesirable. In this paper an attempt is made to study certain methods of treatment of hypertony in relation to their action on blood chemistry.

At the outset it is necessary to differentiate between methods of treating hypertony whose object is simply the reduction of pressure without regard to ætiological factors, and methods whose aim is to reduce pressure by treating the causal factor. The first must be of doubtful value, the second can do nothing but good.

The patients were kept in bed. During the first week no treatment was given. During the second week Collosol sulphur was injected, 3 c.cm. daily. During the third week six pints of water were given daily. The patients were kept on a standard diet all the time. In other cases the procedure was altered. In the first week the patient had no treatment; in the second week he was put on salt- and sugar-free diet; in the third week a diet consisting mainly of carbohydrate, and in the fourth week a pure meat diet was given.

WATER

I know of no method of reducing blood pressure which is uniformly efficacious in all cases. Indeed, considering the various ætiological factors of hypertony, no uniformity can be expected. The drinking of large quantities of water effects a striking reduction in the blood pressure in many cases. G. McLoughlin and I [2] used this method with good effect in cases of high blood pressure with a high degree of viscosity for the purpose of lowering the latter. At that particular time it was not clear to us why the action of water should have been what it was. I am now in a better position, I believe, to conjecture the reason of its beneficial action. Table I. shows that in cases under

TABLE I

	First week (no treatment).					Second week (sulphur injections).					Third week (six pints of water).				
Case.	Urea.*	N.P.N.*	Creatinine.*	B.P. S.	B.P. D.	Urea.*	N.P.N.*	Creatinine.*	B.P. S.	B.P. D.	Urea.*	N.P.N.*	Creatinine.*	B.P. S.	B.P. D.
1	60	—	1·3	190	96	117	—	1·9	150	80	39	—	1·3	150	95
2	85	47	2·0	150	85	102	56	2·4	125	95	60	36	1·7	125	80
3	48	36	1·0	145	80	57	63	1·3	110	70	41	25	1·9	130	70
4	78	54	1·7	150	90	—	—	—	—	—	68	45	1·2	145	85

Chlorides.—Nil. * Mg. per 100 c.cm. B.P.=Blood pressure.

sulphur treatment, pari passu with the reduction of pressure, there was an accumulation of deleterious substances in the blood. The same phenomenon was observed when the pressure fell simply as the result of heart failure. This suggests that high pressure in cases of hypertony is needed for the purpose of maintaining a normal chemistry balance in the blood. On the other hand, cases under treatment with water, although the blood pressure was definitely reduced, showed a normal blood chemistry. The beneficial effect of large doses of water is probably due to the fact that it enables the kidney to excrete urea and allied substances more easily. In this way a normal blood chemistry balance is maintained and there is no longer a necessity for a compensatory hypertony.

It has been contended that large quantities of water increase the strain on the heart by increasing the blood volume. It is, however, obvious that a treatment which reduces pressure and blood viscosity must also diminish the cardiac strain. Moreover, R. Mennie and I, in a yet unpublished work, have showed that there is no hydræmia after the imbibition of large quantities of fluid. Therefore there cannot be an increased blood volume under this treatment. So far as the kidney is concerned, the drinking of large quantities of fluid is all to the good. It has long been established that the work which the kidney performs in passing concentrated urine is far greater than when the urinary output is diluted.

SALT- AND SUGAR-FREE AND PROTEIN DIET

It is clear from Table II. that a salt- and sugar-free diet reduces and a protein diet increases the blood pressure. Broadly it may be stated that in hypertony the blood pressure stands in an inverse ratio to the non-protein nitrogen level in blood. It is true, as we have seen, that after the imbibition of large quantities of water both the pressure and the non-protein nitrogen (N.P.N.) tend to be lower, but in this instance the action of the water is what it is because it apparently does away with a causal factor of hypertony (viz., increased blood viscosity). The blood-urea is somewhat increased under the salt- and sugar-free diet and somewhat diminished under meat diet, although urea is an end-product of protein. It is possible that a low blood-urea after meat may be explained by the diuretic properties of this substance. The increase of blood-urea after a salt-free diet is by no means so pronounced and constant as it is under conditions where pressure-reducing drugs are given.

[1] THE LANCET, 1931, ii., 629.
[2] Quart. Jour. Med., 1930, xxiii.

It is possible the increase has something to do with the maintenance of the normal osmotic pressure, which is lowered by a salt-free diet.

TABLE II

Case.	First week (no treatment).				Second week (salt- and sugar-free diet).			
	Urea.*	Blood chlorides.	Uric acid.*	Blood pressure.	Urea.*	Blood chlorides.	Uric acid.*	Blood pressure.
1	51	375	—	S. 215 D. 150	44	285	—	S. 235 D. 130
2	46	412	3·6	200 104	66	390	—	170 98
3	42	336	4·5	230 124	57	420	4·4	— —
4	36	372	—	255 125	32	310	—	·250 150

	Third week (diet consisting mainly of carbohydrates).				Fourth week (meat diet).			
1	49	510	—	S. 250 D. 130	30	452	—	S. 257 D. 135
2	44	450	4·8	200 90	36	—	—	200 100
3	41	575	4·7	190 105	32	496	5·5	225 112
4	32	410	—	270 174	40	410	—	285 145

* Mg. per 100 c.cm.

After venesection there was a pronounced reduction of blood pressure, and the blood biochemistry remained normal, but, as has been the experience of many others, the beneficial effect of this procedure is only transitory. Within less than a week the blood pressure reached its usual level.

Table III. is interesting because it shows that the urea-concentration test so much in vogue is not always

TABLE III.—*Blood-urea*

Mg. per 100 c.cm.

Case.	Before blood pressure was reduced. Administration of urea.		After blood pressure was reduced. Administration of urea.	
	Before.	After.	Before.	After.
1 ..	48	75	55	67
2 ..	85	102	102	78
3 ..	34	65	41	44
4 ..	60	128	63	105

quite reliable. Urea was given to a patient before the blood pressure was raised and also when the pressure was relatively low and the blood-urea high. The effect of the same quantity of urea was different in the same patient under these two conditions. Apparently, when the blood-urea is already high, an additional dose of urea may exert a pronounced diuretic effect which may result in a lowering of the blood-urea level. This was the reason why the urea-concentration test has given no consistent results in this investigation.

The conclusion is that it is undesirable to employ drugs for the purpose of reducing pressure. On the other hand, the imbibition of large quantities of water ought to be encouraged. The diet should be of low protein content, and excessive amounts of salt should be avoided.

I should like to acknowledge my indebtedness in regard to this work to Mr. G. Williamson.

FURTHER STUDIES ON THE ANTERIOR PITUITARY-LIKE HORMONE

WITH SPECIAL REFERENCE TO IRREGULAR UTERINE BLEEDING *

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A PRELIMINARY report on the treatment of irregular uterine hæmorrhage by hypodermic injection of the anterior pituitary-like hormone extracted from human placentæ was read before the Winnipeg meeting of the British Medical Association in August, 1930 (Campbell and Collip, 1930). The results were so promising that a series of 84 cases has been more continuously and completely studied.

The alleged association of certain physical characteristics with endocrine disorders was a matter of special interest in this study. In each case, therefore, a detailed general history, as also an exhaustive menstrual history was always obtained as a preliminary, while the complete physical examination had special reference to possible endocrine relations. It is interesting to note that in the 60 per cent. of our cases which were examined by X rays to ascertain any possible gross abnormality in the conformation of the sella turcica, no bony changes were found.

Determination of blood pressure, blood Wassermann reaction, and urinalysis were carried out as a routine. The basal metabolic rate in all instances was found to lie within normal limits. Particular emphasis was, of course, laid on the pelvic examination to determine the position, shape, and size of the uterus, and the state of the adnexa; all cases with endocervicitis or birth trauma which in themselves would lead to such pelvic congestion as to predispose to, or cause menorrhagia or metrorrhagia, were excluded. Post-menopausal metrorrhagia was also omitted from the study, on account of its frequent association with carcinoma of the fundus or malignant changes in the adnexa. Nor should one leave out of consideration the possible existence of small myomata in the fundus, for, as Beckwith Whitehouse has pointed out, small mural fibroids may so interfere with the contraction of the uterus as to cause excessive menstrual flow. Moreover, since the surfaces of the endometrium are normally in constant apposition, the presence of any submucosal myoma or other irregularity in the surface, allows of and predisposes to local hypertrophy or polyp formation; myometrial changes in persistent uterine bleeding have been described by Schroeder, Whitehouse, Young, and Lockyer. Too much stress cannot be laid on the need of careful exploration of the cavity of the uterus in order to determine the character of the surface of the wall, as well as to obtain samples of endometrium for histological study.

TYPES OF HÆMORRHAGE

In an earlier communication I stated that cases of excessive uterine bleeding may be grouped into several categories according to their menstrual history. (Table I. and Fig. 1.)

The last group (G) may be further subdivided into four categories, according to the mode of development of the continued bleeding which may arise.

* Read before the Section of Physiology and Biochemistry of the British Medical Association on July 28th.

(*a*) By confluence of regular cycles of varying length of interval with unduly prolonged duration of the flow.
(*b*) By confluence of irregular periods of metrostaxis.
(*c*) Spontaneously, either after a normal menstrual cycle or more commonly after a period of amenorrhœa.
(*d*) As an outcome of puberty.

TABLE I.—*Varieties of Abnormal Uterine Hæmorrhage*

—	Length of cycle.	Amplitude of flow.	Duration of flow.
A	Normal.	Excessive.	Normal.
B	,,	,,	Prolonged.
C	,,	,,	Normal, superimposed on constant bleeding background.
D	Short (19–24).	Normal or excessive.	Normal or prolonged.
E	,, (14 days).	,,	Irregular.
F	A cyclic intermittent bleeding.	Irregular.	,,
G	Continuous excessive hæmorrhages.		

Excessive bleeding may appear at any time from the menarche to the menopause. In cases of metrorrhagia, the size of the uterus may be within normal limits, but more frequently it is symmetrically enlarged, and its consistency may wrongly suggest subinvolution or a sessile fibromyoma. When bleeding commences at puberty the uterus is not necessarily enlarged, but its shape becomes similar to that of the parous woman's uterus, in that the corporacervical angle is less acute. Even in young patients suffering from excessive uterine bleeding it is found that the cervix is slightly patent and easily admits a small sound. In the parous woman the patency is more pronounced.

I should like to emphasise here that the endometrium in menorrhagia and metrorrhagia gives little information regarding the character and severity of uterine bleeding; nevertheless, it is to some extent true that the changes produced in the mucous membrane may be taken as an index of ovarian function in cases otherwise apparently normal. It is clear that where cycles exist samples of the endometrium must be obtained at the same part of the epoch in parallel cases if any comparison is to be made. If the cycles are masked by continuous hæmorrhage, the interpretation becomes more difficult. Moreover, Evans has pointed out, in a critical review of the work of Schroeder, that premenstrual changes in the endometrium occur in some cases immediately after the cessation of the period, and that exactly similar changes may occur very late in the interval, so that the value of comparisons of one case with another, even if samples were obtained at the same time in relation to the apparent menstrual cycle, appears to be hazardous.

It has been shown by Schroeder and by W. Shaw that in cases of metropathia hæmorrhagica the ovaries contain no fresh corpora lutea, but a follicle with cystic changes is the rule (Fig. 2). Although Novak has not confirmed this finding, it is generally considered that the endometrial change is associated with subnormal ovarian function. However, the complete removal of the ovaries does not lead to any similar condition, and J. B. Collip (1932) has found that the fluid from such follicular cysts in cases of this type of irregular uterine bleeding may contain up to 25 rat units of œstrin per c.cm. This suggests that there is a secretion of œstrin from the ovaries which is disproportionately great, whether absolutely or relatively to the reduced activity of luteal tissue which may be inferred from the appearance of the ovaries. With regard to the suggestion made by Shaw, that the ovary produces some abnormal toxic substance, it may be stated that similar suggestions have been made from time to time for other organs of internal secretion, but in every case the view that disturbances are due to excessive or deficient formation of the normal hormone has prevailed.

EFFECT OF THE HORMONE ON BLEEDING

Animal experiments show that excessive doses of œstrin not only affect the production of monophasic cycles, but in continued administration may eliminate the cycles. Excess œstrin affects the entire human organism. As regards the uterus the effect is not limited to the endometrium, but affects the myometrium as well, and herein lies an important consideration. The continued administration of moderate doses of the anterior pituitary-like hormone (A.P.L.) in immature female rats leads to the precocious appearance of normal œstral cycles (Collip, Thomson, McPhail, and Williamson), while the ovaries rapidly attain the size and appearance of those of normal adults. There is, therefore, reason to suppose that this substance might directly, or through the anterior pituitary, correct the changes observed in the ovaries in metropathia hæmorrhagica, and lead to the appearance of normal balanced ovarian function and the recovery of normal uterine structure and function. This expectation was realised in many cases of varied types.

Preparations of different strengths were used, but the dosage was so adjusted that the patient received at least 40 day-rat units per injection. Our best results were obtained by an injection every day for seven days, then every second day until the patient

TABLE II.—*Response to Treatment*

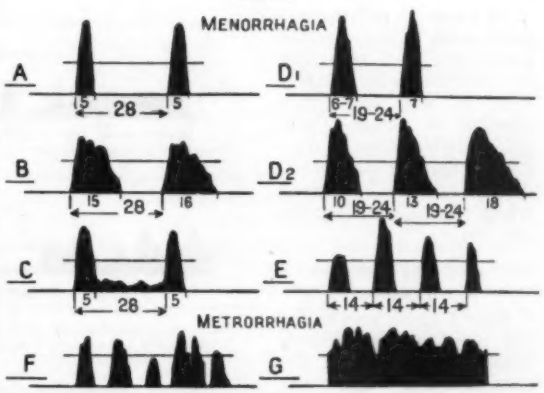
Clinical type when examined.	—	Menstrual characteristics. Previous to onset of present illness. 26–28 days.	19–24 days.	Duration of symptoms. Years.	D and E within 6 months.	D and E prior to 6 months.	Radium prior to 1 year.	Subsequent history. Bleeding. Amplitude. Normal.	Duration. Normal.	Cycles. 26–28 days.	19–24 days. Polymenorrhœa.	Metrorrhagia.	Intermittent or temporary amenorrhœa. Three months.	Menopause.	Unimproved.
A	11	11	—	½–1	1	1	1	11	11	11	—	—	1	—	0
B	14	14	—	1–2	4	1	1	14	12	12	—	—	—	—	2N
C	6	6	—	½–1	2	1	—	5	5	5	—	1M	—	—	1M
D	18	5	13	1–7	5	1	—	16	16	10	7	—	2	1	1H
E	8Q	3	3	½–1	2	—	1	8	8	5	3	—	—	—	2P
F	7R	5	2	–½	—	—	—	7	7	6	1	—	—	—	0
G	20L	15	—	1–11	7	6	5	15	15	10	—	5T	5S	1	5T

Legend.—(L) Of these, bleeding dated from puberty in five cases. (M) This case recently curetted, non-response probably due to endometritis (infected). (N) Small submucous fibroids ½ to 1 cm. in diameter. (H) Aged 51. Uterus explored and found normal. Endometrium showed moderate cystic hyperplasia with œdema of the stroma. (P) Two returned to 14-day cycles. (Q) One of these, condition dates from puberty. (R) Entire group of recent origin. (S) Existing since puberty. (T) One chronic nephritis, one due to pelvic inflammatory disease, two showed after hysterectomy, uterine musculature hyperplastic and in places atrophied, ovaries large, follicular cysts with no potential Graafian follicles, no evidence of recent corpora lutea. One case unexplained.

had passed through two menstrual cycles. When the menstrual flow became of normal duration and proportion treatment was discontinued. A high percentage of cases in all groups responded as shown in Table II. In all groups there were some instances of recurrences of menorrhagia or metrorrhagia, but upon reinstitution of the therapy the cases responded with comparatively few injections. Group D, however, proved disappointingly refractory.

In typical cases of so-called metropathia hæmorrhagica, such as those shown in Fig. 3 appended, the institution of A.P.L. treatment did not cause any immediate cessation of bleeding; indeed, while hæmorrhage commonly became less copious, there was no striking change for eight to ten days, and then the bleeding became very profuse, usually worse in the morning, with sharp "spurts" throughout the day. This exacerbation, however, gradually subsided, and the bleeding practically disappeared except for slight metrostaxis, for from four to five days' duration, or lasting into the next cycle. The majority of cases, when treatment was continued, manifested a menstrual period on the twenty-eighth day after the first exacerbation (which is regarded as an epoch superimposed on the background of more or less continuous hæmorrhage), and at this period the hæmorrhage was usually greater than a normal flow in duration and amount, clots and large mucosal fragments were passed, accompanied by considerable pain. Usually the treatment was discontinued at this point; if, however, the uterus remained large, and no pain was experienced, the treatment was continued; it was assumed with some reason that the bleeding of metropathia, which is characteristically painless, was not overcome and that the myometrium had not returned to normal (Fig. 4, Case A). It may be that several menstrual cycles must elapse before the endometrial overgrowths are completely shed, since Whitehouse has shown that the uterine mucosa is not completely

FIG. 1



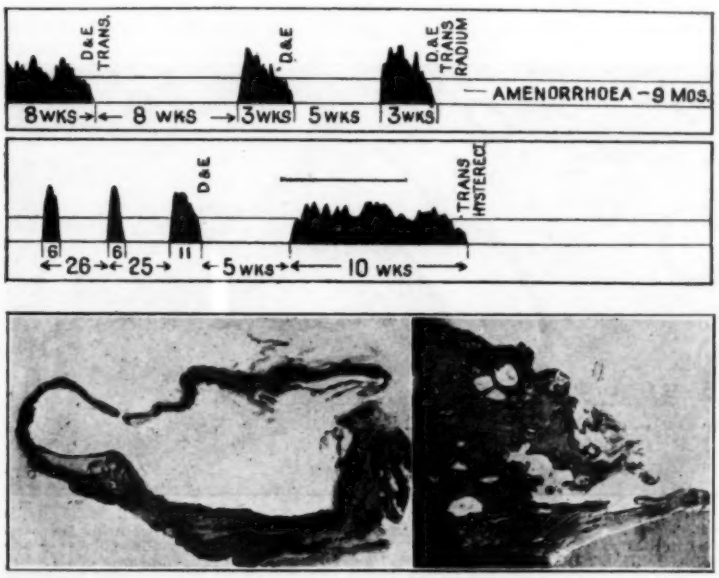
This represents the eight different menstrual types into which the cases have been arbitrarily divided. D_1 and D_2, however, may be found at different times in the same individual. The graph indicates the quantity and duration of the bleeding. The upper horizontal line represents the normal blood loss, whilst the length of the interval in days is shown by the figures below.

nor uniformly shed, even in normal menstruation. On the other hand, in cases which were curetted prior to the institution of therapy the result was considerably hastened (Fig. 4, Case B). Once cycles of normal interval and proportion were established, they continued normally thenceforward, and in all cases which responded the uterus too returned to normal proportions. This maintenance of normal rhythm has been followed in some cases for over two years. There were, of course, exceptions to this typical history — for example, in women near the menopause, where the cessation of hæmorrhage is followed by amenorrhœa. It is of interest to note that the vasomotor disturbances of the menopausal syndrome did not appear in such cases.

In patients with continuous uterine bleeding dating from puberty the gross response was satisfactory, no matter how long the hæmorrhage had continued, though after one or two cycles the normal rhythm was not perfectly established, being punctuated with periods of amenorrhœa lasting up to three months. Only very occasionally did the symptoms recur. It is worth noting that over 10 per cent. of the cases in this entire series had at some time or another previously been treated with radium or X rays, with only temporary improvement.

In cases of post-partum metrostaxis the results were particularly good; there were ten cases treated, and all responded.

FIG. 2



Aged 35, married, 3-para. Some 20 months are represented graphically on the chart. Left ovarian cyst size of hen's egg. Uterus slightly enlarged. The endometrium absent in the lower portion of the uterus. On section, the uterine musculature showed definite hyperplastic changes. In the fundus the endometrium slightly polypoid, and microscopically showed cystic hyperplasia. On serial section, left ovary atrophied and cystic; right ovary contained corpora lutea, but not of recent development. No maturing Graafian follicles to be found. The greater portion of the ovary replaced by scar tissue, showing almost complete replacement of ovarian tissue by cyst (left ×½) also corpus luteum not of recent development. Section of endometrium (right ×5) shows cystic hyperplasia.

Excessive menstruation following abortion responded similarly.

When pelvic inflammatory disease was the cause of metrorrhagia or menorrhagia the symptoms were aggravated by this method of treatment.

In cases of polymenorrhœa with flow of normal character, but recurring at irregular short intervals, it was sometimes possible to increase these intervals by three or four days; the previous condition, however, recurred when treatment was discontinued.

FIG. 4

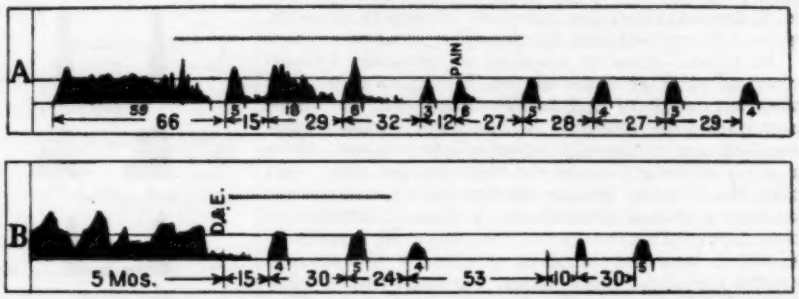


Chart showing history of two cases treated with A.P.L. The horizontal cross-hatched line indicates the period through which treatment was administered. A, was curetted four years before the institution of therapy. Curettings at that time showed a hyperplastic endometrium. B, was mildly curetted immediately before the institution of therapy. Microscopical examination showed cystic hyperplasia of the endometrium with some œdema of the stroma. (Fig. 3 C.)

OTHER USES OF THE HORMONE

May I again emphasise the need of an outlook that extends beyond the endometrium and the study of mere local changes? The entire human organism is influenced by ovarian function. While the endometrium is a tissue easily accessible to study, the pattern of which alters from day to day, there are changes of a general biological character which may give rise to clinical symptoms, though they are not evident in the endometrial architecture.

In this connexion clinical trial of A.P.L. extract was extended to other conditions. Thirty cases were treated for menopausal symptoms and 24 responded. The improvement was marked even when a considerable time had elapsed since the last menstruation. In six of these cases in which periods had ceased for various lengths of time up to one year, menstruation reappeared in from eight to ten days.

In cases with mastalgia, or so-called chronic mastitis, particularly those associated with abnormal menstrual cycles, not only was the pain relieved, but the small pea-like nodules in the breast disappeared. Let me add here that the normal mammary gland was never affected even in prolonged administration of A.P.L., nor was the post-partum breast in any way altered.

A form of urticaria associated with subnormal ovarian function and refractory to all other forms of medication disappeared with the administration of this hormone. Vomiting of early pregnancy was not improved, though it is worthy of note that in none of the cases treated was there any tendency to

FIGS. 3 A B C

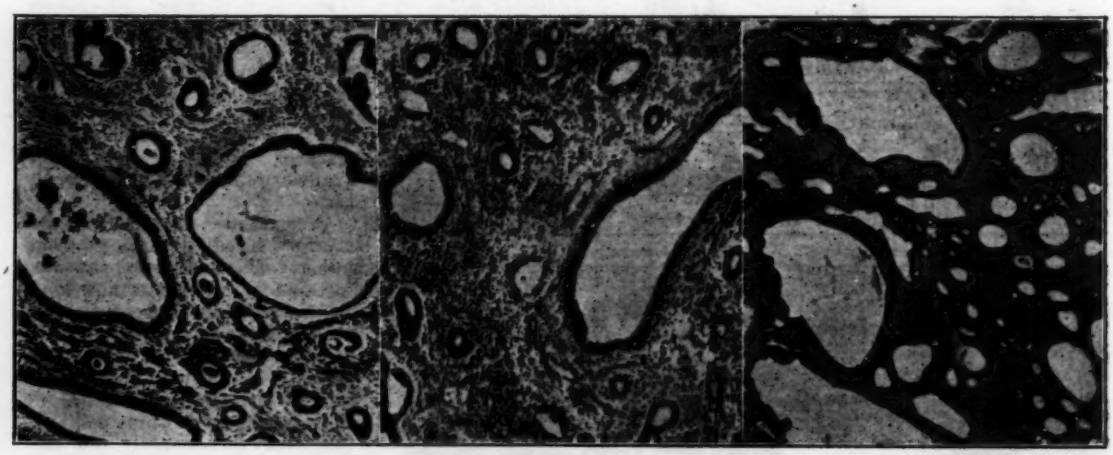


FIG. 3 A.—Aged 21, single, puberty age 14. Menstruation irregular. Metrorrhagia lasting for several months. During the past seven years was curetted three times for this condition. Bleeding profusely for four months prior to coming under observation. Uterus slightly enlarged, very firm, three inches in depth. Contour of cavity normal but hard. Photomicrograph (×40) shows marked glandular and cystic hyperplasia. A.P.L. administered for six weeks. Normal cycles followed after an initial lapse of menstruation for three months.

B.—Aged 35, 2-para. Menstrual history characteristically normal until three years ago, when periods became more profuse. For two months, metrorrhagia in addition to menorrhagia. Section (×40) shows polypoid hyperplasia with cystic glands. Stroma œdematous. After two months' treatment menstruated normally and cyclicly. One year later symptoms recurred, but with six injections of A.P.L. intermenstrual bleeding ceased and cycles became of normal proportions.

C.—Aged 43, 4-para. Menstrual history characteristically normal. Metrorrhagia for past six months. Uterus enlarged, firm, but normal in shape. Parametrium and adnexa apparently normal. Cervix slightly patent, depth of cavity 4½ in. Walls firm, contours normal. Gently curetted. Endometrical stroma (×20) shows irregular areas of œdema. Hæmorrhagic areas throughout; glands greatly dilated, containing blood and hyaline secretion; epithelium of columnar type; many cells vacuolated. No areas of infiltration. Treated for two months. Subsequent history represented in Fig. 4 B. Uterus returned to normal proportions.

abortion. Cases of sterility, in most instances associated with polymenorrhœa, did not become pregnant, though two cases suffering from metrorrhagia became pregnant while being treated, and one other with a similar condition became pregnant immediately after cycles were established.

Dysmenorrhœa was intensified. It has previously been pointed out that in the treatment of menorrhagia and metrorrhagia the appearance of pain frequently marked the beginning of improvement. Intermenstrual pain (Mittelschmerz) became more severe under treatment.

In cases with normal cycles no change either in the amount of hæmorrhage or the duration of the interval was observed, even when the injections were continued for months.

A typical menstrual period occurred in ten cases of secondary amenorrhœa in from 10 to 14 days after therapy was instituted. No success was obtained in similarly treating primary amenorrhœa. The preparation of anterior pituitary-like hormone used by us did not cause any local symptoms or alteration in blood pressure levels or give rise to systemic reaction.

It is generally held that the corpus luteum is essential for normal menstrual cycles, but I believe that this dogma must be modified, as pointed out in a previous communication (Campbell and Collip, 1930). Moreover, Corner and Hartman have shown that the corpora lutea are not necessarily present in ovaries showing cyclic activity as manifested by menstruation. Ovarian function in the human may, therefore, be largely appraised by the regularity, amplitude, and duration of the menstrual epochs as well as by general well-being.

IMPRESSIONS

(1) There are several types of irregular uterine bleeding which may be distinguished by their menstrual histories. In selecting cases for treatment, correct diagnosis is essential; the organs in the pelvis must be palpably normal, and the presence of neoplasms of the uterus must be excluded. (2) Menorrhagia and metrorrhagia due to inflammatory diseases are aggravated. (3) Metropathia hæmorrhagica responds particularly well. Pain is taken to signify that the musculature has returned to normal tone, and that the hyperplastic endometrium is being rapidly expelled. (4) Response is not so consistent in metrorrhagia of puberty, and treatment is followed by periods of amenorrhœa. (5) Menopausal symptoms are alleviated. (6) Mastalgia, if accompanied by disturbed menstrual cycles, frequently subsides. (7) No permanent improvement is noted in simple polymenorrhœa. The symptoms of dysmenorrhœa are intensified. (8) There is no effect in pregnancy, and no effect upon normal menstrual cycles as regards interval, amplitude, or duration; no local or constitutional symptoms are observed. (9) It is considered that the effect of the anterior pituitary-like hormone is to cause the ovary to resume a complete and balanced endocrine activity, in place of one that is unbalanced and incomplete.

The extract used in these studies was prepared in the Bio-Chemical Laboratory of McGill University by Prof. J. B. Collip. The method of preparation and physiological properties of the anterior pituitary-like hormone have been published previously (ref. 3).

I wish to thank the staffs of the Royal Victoria Hospital and the Montreal General Hospital for their kind coöperation.

(*Continued at foot of next column.*)

CLINICAL OBSERVATIONS ON MALARIA TREATED WITH TEBETREN

By D. G. Stoute, M.B. Edin.
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An account by Dr. R. Green in The Lancet of April 16th (p. 826) of the successful treatment of malaria with Atebrin, a new synthetic drug consisting of an acridine compound, has stimulated me to write my clinical observations on the treatment of malaria with a new preparation, known as Tebetren, which combines the virtues of quinine and an acridine dye, and does not discolour the patients during treatment. Its composition is methyl-hydrocupreine-methyl-acridine-dehydrocholate, and it is unnecessary to add any other preparation as the quinine is combined with the dye. To render the preparation non-toxic the compound is united with a bile-salt. Tebetren was supplied to me for trial by the Natal Health Department in 1930 in tablets of about grs. 3 each, pale yellow in colour and with a bitter taste. When crushed the tablet is slightly soluble in cold water, more so in alcohol, and insoluble in ether. The colour of the solution in water and alcohol is greenish-yellow.

At my suggestion the manufacturers supplied me with the preparation in ampoule form (2·1 c.cm. in each). Intradermally the preparation is painful and causes sloughing of the skin at the site of the injection, with inflammatory reaction around. Sloughing is not however deep-seated. Intramuscularly into the gluteus maximus little or no pain was complained of, nor was there any local reaction at the site of injection. Routine was oral treatment; in cerebral cases one ampoule was injected intramuscularly every four hours during the day until the patient was conscious, and then oral administration continued. I have not administered the preparation subcutaneously or intravenously, although it is claimed that subcutaneous injection with massage will not cause any local reaction. It is claimed to act more readily on schizonts than gametes. It stimulates the phagocytic power of the blood for a much longer period than quinine and exerts a destructive effect on any stage of development of the malarial parasite.

To date some 80 European adults and about 20 children whose ages varied from 2 to 12 years have been treated: the course for adults being 2 tablets every 4 hours, if possible including the night, for 30 uninterrupted doses, for children ¼ to 1 tablet according to age every 4 hours for 30 doses. Four courses (120 doses) are given and as tebetren is cumulative in action a rest of 3–5 days is necessary between each.

European patients (14 in number) so treated

(*Continued from previous column.*)

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who gauzed their living quarters to safeguard themselves from reinfection have not relapsed for a period of over 18 months. Infections that were resistant to quinine treatment reacted to tebetren and gave three negative monthly smears after the fourth course.

The original test cases in 1930 were an indiscriminate selection of an Asiatic (Indian) and 14 natives (Basuto, Xosas, Zulus), all proved by slides to be suffering from subtertian and benign tertian malaria. Unfortunately these cases being of the mobile population were discharged from hospital after a negative phase had been established by uninterrupted 4-hourly dosage. One Zulu however was kept under observation for a period of six months. In his case, a negative phase having been established, I was unable to precipitate an attack of malaria by adrenaline or douching with cold water after severe work.

Patients complained of what I interpret to be mild toxic effects—viz., (1) a feeling that the skull was too small for the brain; (2) a lightness of head with or without slight deafness; (3) a singing in the ears. These complaints were made during the first course and got less and less in subsequent courses. Others complained of feeling bad, but could not definitely explain. This type of complaint was met by a large drink of tea or water at the time of dosage, or by alkalising the patient with copious drinks of bicarbonate of soda in water. I quote this last simply as a possible toxic effect, for in many cases it was, I believe, due to malaria.

In the 4-hourly slide controlled cases the results were as follows: In benign tertian infection the average minimum time taken for parasites to disappear from the peripheral blood was 48 hours, in subtertian infection 36 hours. With quinine bihydrochloride grs. 30 per diem the time was: 110 hours for benign tertian, 72 hours for subtertian. I have not treated a case of quartan infection which is a rarity in this area. In neither benign nor subtertian infections have sexual forms of parasites been found. The febrile condition was on the average controlled in both types of infection in 48 hours.

Symptoms of malaria—viz., large spleen, with or without tenderness, aching body, vomiting, headache, &c.—responded readily to treatment, especially the distressing vomiting. Pregnancies varying from five months onwards were uninfluenced by the treatment. One case of cerebral malaria in a native female about six months pregnant was treated energetically with intramuscular injections of tebetren, four hourly during the day, and regained consciousness after a period of four days and nights, when oral administration was continued. She gave a negative slide after the fourth course, and is at the moment going on well with pregnancy uninterrupted.

CONCLUSIONS

1. As compared with quinine the action of tebetren is more rapid.

2. It possesses a lethal action on benign and subtertian parasites and may inhibit the formation of gametes.

3. Patients were more rapidly in a state of recuperative well-being than with other forms of treatment I have used.

4. Little or no toxic effects occurred other than those stated above, and patients (Europeans) who relapsed after three negative tests, and who may have been reinfected at home, readily presented themselves for further treatment.

5. Satisfactory results were obtained in cases resistant to quinine.

I am indebted to Dr. Park Ross, assistant medical officer of health for the Union of Natal, for supplying me with samples of the preparation, and to Dr. B. Sampson, Government pathologist, for examining a number of blood slides.

CHOLECYSTOGRAPHY *

By James F. Brailsford, M.D. Birm.

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No branch of radiology requires more careful attention to technique and interpretation than that of the examination of the gall-bladder, and the accuracy of the radiologist's reports varies directly with his appreciation and care of detail. The best results will be obtained when he personally carries through the whole procedure. His report is the radiographic evidence on which the clinician should rely, and it should be so worded as to convey an opinion as to the nature of the pathological lesion revealed. A mere description of the appearances presupposes that the clinician can interpret the significance of shadows which he would probably not notice unless the radiologist pointed them out to him. The significance of radiographic appearances is best appreciated by those who make it their sole study; the subject is too vast to permit of excellence in any other specialist subject. Even the regional specialist who attempts to interpret radiograms is usually ignorant of the fundamental radiographic technique and the changes that may be due to alteration of that technique; he may also fail to recognise the appearances familiar to the radiologist in other parts of the body, the knowledge of which may be all-important in diagnosis.

I believe it to be the duty of all radiologists to issue a report with every radiogram sent to the clinician, and it is on the value of his reports that his reputation should be built up. Wise clinicians realise this, and must be familiar with many instances of error due to the folly of inexperienced interpretation.

PREPARATION OF THE PATIENT

The gall-bladder is in close relation to the hepatic flexure and the first part of the transverse colon, the stomach and duodenum, and its shadow may be obscured by opaque or gaseous contents of these organs. If bismuth or any other opaque material has been taken by the patient, a mild aperient should be given two days before the X ray examination, and the patient kept on a light diet during this period. Drastic purgation is likely to result in distention of the bowel by gas which will obscure the gall-bladder shadows. If the patient is constipated a simple enema may be given, followed by a saline enema to wash out the contents of the bowel, taking care that no air is introduced.

PRELIMINARY RADIOGRAPHY

It is essential that before any opaque material is introduced into any organ for radiographic purposes

* Based on a paper read before the Section of Radiology of the Royal Society of Medicine.

a preliminary radiogram be taken and carefully studied for any trace of abnormality. Failure to do so may result in faulty diagnosis and the missing of the essential lesion, owing to the obscurity produced by the opaque medium used. In a previous paper [1] I have given a list of the lesions I had discovered by preliminary radiographic examination, and often these were the only pathological signs discovered, and in many cases the cause of the symptoms. On the one hand, the clinical signs and symptoms of gall-bladder disease may be present when this organ is functioning normally, while, on the other hand, gall-bladder disease may be accompanied by signs and symptoms which do not suggest that there is anything wrong with it. In some cases of obscure abdominal disease the inclusion of a preliminary radiogram of the bones of the pelvis may throw light on the pathology of the condition.

The preliminary radiogram of the gall-bladder area I take with the patient lying prone on the Potter-Bucky diaphragm, with the arms folded above the head and the head resting on the left arm, looking towards the right, so that there is a slight rotation of the body to the right. The X ray tube is centred 30 inches above the Potter-Bucky diaphragm, over a point 2 inches to the right of the spine over the last rib, and an exposure of ½–2 seconds, varying with the thickness of the patient, using 100 m.a. (milliamperes) of current. The slight obliquity of the patient will throw the shadows of the gall-bladder away from those of the spine. Well-defined gall-stone shadows and a good shadow of a dye-filled gall-bladder may be entirely missed, because they are superimposed on the shadows of the spinal column. It is obvious, therefore, that if thin gall-stone shadows are to be seen these must be projected away from the shadows of the spine.

The shadows of well-defined faceted calcium-containing gall-stones leave little to the imagination in interpretation. Examples of such radiograms are now to be found in almost every X ray department, though a few years ago only a select few radiologists possessed them and knew their demonstration by X rays to be possible. The more common radiographic appearance—though to the trained eye it is as significant—is the ill-defined, thin, flaky shadow which I believe can be demonstrated in about 30 per cent. of cases in which gall-stones are present. These shadows may be obliterated by the slight movement of the gall-bladder due to body movement or visceral peristalsis, yet there may be little on the radiogram to suggest movement. They may only be seen on radiograms taken with a fraction-of-a-second exposure, and can be best demonstrated by using a cone without the Potter-Bucky diaphragm. These thin gall-bladder shadows may also be obliterated if dye enters the gall-bladder, and a normal gall-bladder may be reported, the stones being of the density of the dye concentration.

Occasionally one finds that the wall of the gall-bladder is calcified, while sometimes it is full of opaque sand which has a radiographic appearance like that of a dye-filled gall-bladder. This has led to the faulty interpretation of the cholecystogram in cases where no preliminary radiogram had been made. Where the stone is solitary, difficulty of interpretation may be experienced, but subsequent radiograms with alteration of position, and radiograms in different positions after the injection of the dye, will clear up most of the difficulties. The demonstration of gall-stone shadows on the radiogram does not necessarily account for the cause of the patient's illness, and if the complaint suggests any other lesion, this should be searched for in addition. I recorded [2] the discovery of a small carcinoma of the transverse colon in such a patient over four years ago, and since its removal she has had no further symptoms.

INJECTION AND ORAL ADMINISTRATION

Those of us who have been keen on the radiology of the gall-bladder have watched the gradual but marked improvement in the chemicals used in cholecystography. When I read my first paper on cholecystography in 1925 we were injecting sodium tetrabromphenolphthalein intravenously. This dye was toxic for a relatively large number of patients, and the gall-bladder shadow, compared with those now obtained, was relatively faint. This dye was replaced by sodium tetraiodophenolphthalein because the latter could be given in smaller quantities with lessened reaction and greater density of shadow. Gradually the oral administration of the dye was introduced and improved. At the beginning this was a very poor substitute for intravenous administration, but it was used because many radiologists would not go to the trouble or worry of intravenous injection, and many faulty radiographic reports were issued. In March, 1928, I published a paper [3] containing the evidence collected after 500 cholecystographies, in which I expressed the opinion that I regarded the intravenous method as the more accurate. Now after another four years, during which period cholecystography has become a routine procedure in the investigation of gall-bladder cases, I am still of that opinion, though I have also to acknowledge such a marked improvement in the quality and function of the dye now used for oral administration that it now falls little behind the intravenous in its results.

The arguments in favour of the intravenous method are that a known amount of dye is administered into the circulation, and the degrees of concentration of the dye in the gall-bladder is not so confusing; the gall-bladder shadow is not obscured by the shadow cast by the dye in the intestine. The hepatic function test can be made at the same time. It can be given to the patient with nausea of a degree which will not tolerate oral administration. Preferably the patient is kept under the control of a nursing staff until the radiograms are made. The oral route, on the other hand, does not necessitate hospital or nursing-home attention; the patient can take the dye at home and come up next morning for radiography, while the radiologist is saved the trouble and worry of an intravenous injection and its complications. The reactions to the dye are relatively slight or absent; in many patients no abnormal symptoms are detected, and no cathartic action from the dye occurs, though in others the dye is strongly purgative.

In the early days of oral administration the dye used often caused violent vomiting, but the present oral preparations rarely do this.

INTRAVENOUS CHOLECYSTOGRAPHY

After the preliminary examination an inspection of the anticubital fossæ is made, and that arm is selected which shows the most prominent veins.

At about 9 P.M. the patient, lying in bed, has the arm cleaned up with spirit; a tourniquet is applied to the upper arm sufficiently to cause distension of the veins, and a syringe needle is thrust into the median basilic vein. Blood spurts out of the end of the needle until a connexion is fixed into it from a 40 c.cm. syringe barrel containing a few cubic centimetres of sterile normal saline. The syringe is connected by means of a rubber tube containing a small glass connexion near the needle end. The saline is allowed

to flow into the vein, the tourniquet being taken off immediately the connexion is made between the syringe and the needle. The flow of saline is slow, and when most of it has left the syringe with every indication that it has gone into the vein, 30 c.cm. of a filtered sterile solution containing 3 g. of sodium tetraiodophenolphthalein are poured down the side of the syringe barrel. If the flow ceases (and this appears to happen more often in those veins one would least expect to give rise to trouble—i.e., the large superficial veins which are readily entered and from which blood spurts out while the tourniquet is in position), the piston of the syringe can be applied and gentle pressure applied until the whole of the dye has been injected. On the slightest indication that the dye is not going into the vein the injection is stopped.

No food or drink, apart from sips of water, is allowed. The patient is brought to the radiographic department at 9 A.M., 11 A.M., and 1 P.M. on the following day, and radiograms are made of the gall-bladder area, using the same technique as in the preliminary examination. Unless the gall-bladder is visible on the screen, it is customary to always use 15″ × 12″ films, because of its variable position. Any abnormal shadows or irregularity of the gall-bladder should be investigated by taking additional radiograms in different planes. Bubbles of gas in the intestine may simulate negative gall-stone shadows. After the sixteenth-hour radiogram has been taken the patient is given a barium meal made up with Horlick's milk; a radioscopic examination is made of the stomach and duodenum, and the relation of the gall-bladder to these structures and its mobility is carefully observed on the screen during palpation.

In a paper [3] on gall-bladder radiography in 1927 I recorded non-filling of the gall-bladder in two cases in which the gall-bladder was normal, but in which an ulcer of the stomach and duodenum had been found at operation. This observation has since been made by a number of radiologists, and its possibility should be borne in mind. Only recently such an event was brought to my notice.

A patient had had a cholecystographic examination, and the radiologist had reported that the gall-bladder had failed to fill; but as the symptoms did not suggest gall-bladder disease the patient was not operated upon. He died from the perforation of a chronic ulcer on the lesser curvature.

This emphasises the importance of following up the cholecystogram with a barium meal. No clinician can be certain that it is the gall-bladder or the stomach or duodenum which is diseased. Because the patient's symptoms suggest gall-bladder disease, and because the cholecystogram suggests a normal gall-bladder, it cannot be said that organic disease is or is not present. If necessary, of course, the barium meal can be given later. In one case in which only a cholecystograph was asked for I recorded that the gall-bladder showed normal appearances, the patient was brought back to hospital within a fortnight with a perforated duodenal ulcer from which he died. At the post mortem, the cholecystographic findings of a normal gall-bladder were confirmed, and the perforated ulcer was shown. This case and the one recorded above proves that while in some cases of ulcer the gall-bladder fails to fill with dye, this cannot be depended upon. The additional radiograms taken after the barium meal may reveal gall-bladder or other shadows which have not been observed on the previous radiograms. Often one sees shadows of definite significance on one radiogram but not on another, or its significance is confirmed by alteration in position or arrangement seen on other radiograms.

ORAL CHOLECYSTOGRAPHY

The preparation which I am now using is that called opacol. It is stable, is not too unpleasant to take—very rarely causing any sickness—is readily absorbed, and gives a good contrasty shadow of the normal gall-bladder. It is British-made, and less expensive than some of the other preparations.

The patient is asked to come for a preliminary radiographic examination, after which he is given a bottle containing the opacol with the request that he has a fat-free meal—dry toast or biscuits and tea—at 6 P.M., and the whole of the contents of the bottle at 8 P.M., in half a tumbler of water, followed by a further drink of water to remove the taste from the mouth. The patient is advised to go to bed just before 8 P.M., and to return for X ray examination at 9 A.M. the following morning, having taken no food or drink apart from sips of water since 6 P.M. the previous evening.

The same technique for radiography is adopted as that already described, and the barium meal is given after the seventeenth hour from taking the dye. A further radiogram is always taken three hours after the barium meal, for this may give additional evidence on the condition of the gall-bladder, stomach, or duodenum.

With the oral preparation, the only likely ill-effect is purgation, and in many cases this is not observed. No reaction of a serious nature due to the dye has ever been recorded. The test is therefore safe, and in a very high proportion of cases (probably over 90 per cent.) accurate, particularly if the preliminary examination and the barium meal are used as part of the examination as I have described.

If the cholecystographic findings, using the oral method, are opposed to the clinical findings, further information may be gleaned by a second oral test or by intravenous administration of the dye.

NEGATIVE SHADOWS

Cholesterol and pigment gall-stones have a radio-opacity so similar to that of the bile and surrounding tissues that it is impossible to demonstrate them on the ordinary radiogram, even if the gall-bladder is radiographed after its removal from the body. When, however, the gall-bladder has been filled with bile containing tetraiodophenolphthalein, which has a greater radio-opacity than the stones, these appear as darker shadows, resembling gas-bubbles (negative shadows) within the lighter gall-bladder shadow. On the other hand, shadows of gall-stones of greater radio-opacity, which ought to have been shown on the preliminary radiograms, may now be obliterated because of the increase in density of the gall-bladder. These negative shadows are so like gas-bubbles that, unless care is used, the latter may be interpreted as gall-stones; radiograms in the lateral and semi-lateral positions will alter the relative positions of the gas-bubbles in the intestine and the gall-bladder; but negative gall-stone shadows, though they may appear to have altered in position, remain within the shadow of the gall-bladder.

CONCLUSIONS

(1) No branch of radiology requires more careful attention to technique and detail than gall-bladder radiology.

(2) The X ray examination should always include preliminary examination, cholecystography, and barium meal—in this sequence.

(3) Some gall-stones can be shown on the preliminary radiogram, and some on the cholecystogram, but there remains a proportion which cannot be shown on X ray examination. The greater

the care taken in technique, the smaller is this residue.

(4) The radiographic demonstration of gall-stones does not necessarily mean that the lesion causing the patient's illness has been discovered. Gall-stones may exist without causing any marked symptoms, or they may produce symptoms which are atypical.

(5) The dye can be administered either by the mouth or intravenously. The former is now the best routine method of examination, though the latter is still the most accurate.

(6) In about 96 per cent. of cases non-filling of the gall-bladder indicates a pathological condition of the gall-bladder, often accompanied by stones, though these may not be shown by the radiogram.

(7) Poor filling of the gall-bladder on repeated examination also indicates a pathological condition of the gall-bladder.

(8) In a high proportion of cases a good gall-bladder shadow, which is normal in shape, size, and position, uniform in outline and density, and which contracts after a meal to a much smaller size, indicates a normal gall-bladder. A small proportion of such gall-bladders may be diseased, and even contain a small collection of stones.

(9) Any abnormality in the area of the gall-bladder before or after the gall-bladder has been filled with dye should be investigated by further radiograms taken according to the type of abnormality seen.

(10) It has been demonstrated that a large collection of gall-stones in the gall-bladder can be passed into the intestine via the ducts.

(11) Complete gall-bladder radiology enables us to give a fairly accurate and the best opinion as to the condition of the gall-bladder.

References.—1. Brailsford, J. F.: Proc. Roy. Soc. Med. (Sect. Electro-Therap.), 1927, xx., 45. 2. Brailsford: Brit. Med. Jour., 1928, i., 484. 3. Brailsford: Brit. Jour. Radiol., 1927, xxxii., 41.

Clinical and Laboratory Notes

A CASE OF PERNICIOUS ANÆMIA

ASSOCIATED WITH MENTAL DISEASE

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PERNICIOUS anæmia is more often a cause of mental disease than is generally recognised, and it is important to elucidate this ætiological factor as early as possible, since adequate treatment is followed by very satisfactory results. The following case illustrates this, as well as several other points of interest.

A married woman, aged 59, was admitted to the Knowle Mental Hospital under certificate on June 24th, 1931. She had never been previously certified, and there was no history of insanity in the family. The general physical condition on admission was moderately good; the heart was enlarged (old mitral disease), and there was some arterio-sclerosis, but there were no abnormalities in the nervous system. She expressed persecutory delusions directed against her husband: "He is making life a hell for me; he attempts to murder me or to drive me to suicide; he is a rotter and a drunkard." She took no interest in her environment, and her mood was one of depression.

The progress of the case was as follows:—

July 8th, 1931: Seems to be developing some insight. Thinks her accusations were not entirely justified. Still very depressed and anergic. *15th:* Remains depressed. Weeps readily.

August 5th: Complains of faintness, weakness, loss of strength. Unable to stand. No mental change.

Oct. 16th: Complains of abdominal pain, feels as if "a band were constricting her abdomen." Listless and anergic. *17th:* Skin shows lemon yellow colour. Blood count: red cells, 1,460,000; white cells, 2230; Hb., 35 per cent.; colour-index, 1·7; marked poikilocytosis and anisocytosis. Patient complains of numbness and stiffness of the lower extremities. Her gait is very unsteady and ataxic. The deep reflexes are brisk. Marked Rombergism is present. The plantar reflexes are indeterminate. No objective sensory disturbance. Patient is put on ½ lb. liver daily—half raw, half cooked—and a lemonade containing acid. hydrochlor. dil. ℥ii to half a pint.

Nov. 2nd: Blood count: red cells, 3,070,000; white cells, 10,900; Hb., 45 per cent.; C.I., 0·7; some anisocytosis present. Patient unable to walk. Still complains of "numb" feelings in the back and lower extremities. *24th:* Mental improvement commencing. Does not weep. Attempting to occupy herself.

Dec. 24th: Taking more interest in her environment and is decidedly more cheerful.

Jan. 16th, 1932: Blood count: red cells, 5,400,000; white cells, 6900; Hb., 74 per cent.; C.I., 0·7; slight anisocytosis. The left knee-jerk is somewhat increased. The plantar reflexes are still indeterminate. Patient still unable to walk without aid. No sensory disturbance. *25th:* Can walk a few yards on her own. Uses a wide base.

March 19th: Blood count: red cells, 5,540,000; white cells, 6600; Hb., 90 per cent.; C.I., 0·8. *24th:* Skin and mucous membranes good colour. Gait steady, and she can walk unsupported, though still uses a somewhat wide base. The plantar reflexes are flexor. There is a little spasticity in the muscles, and the left knee-jerk remains exaggerated. *30th:* Discharged on one month's trial.

April 27th: Discharged off trial.

That pernicious anæmia can cause mental disease is now an accepted fact. Psychogenic factors can of course be elicited in these cases, as indeed in every type of mental disease; but these factors are only a condition and would not of themselves bring about a mental disturbance. In this particular case the patient had repressed into her unconscious hostile feelings directed against her husband (for which indeed there may have been some justification) and the impaired physical state, by lowering the power of the repressing psychic forces, permitted these feelings to appear in the conscious as persecutory delusions.

Mental symptoms may appear before the condition of pernicious anæmia is recognisable clinically, and may be so prominent that the underlying blood state is overlooked. Hence the importance of an early blood examination.

Of special interest here is the development of early signs of subacute combined degeneration of the spinal cord, and their amelioration under liver treatment. According to McAlpine [1] the effect of liver on the neurological signs is variable, and he states that improvement is only slight once the Babinski reflex appears. In the present case the neurological symptoms were attacked early—no Babinski sign having been obtained—and this may account for the satisfactory response. C. C. Ungley and M. M. Suzman [2] lay stress on the importance of instituting liver therapy as soon as possible.

In those cases of pernicious anæmia with psychotic symptoms that develop the signs of subacute combined degeneration there is a danger of diagnosing the latter as "functional." In fact the possibility of hysterical astasia-abasia was raised in this case at first. The blood examination settled this point at once.

I wish to thank the medical superintendent, Dr. J. L. Jackson, for permission to publish this case.

[1] THE LANCET, 1929, ii., 643.
[2] Newcastle Med. Jour., 1929, ix., 67.

ANEURYSM OF THE AORTIC ARCH

TWENTY-NINE YEARS SURVIVAL

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MEDICAL TUTOR AND REGISTRAR

In January, 1899, a man, aged 33, was admitted to the General Infirmary at Leeds under Dr. A. G. Barrs, complaining of cough, pain in the front and right side of the chest, and in the shoulders and back of four weeks' duration.

He had had "rheumatism" in the shoulders three years and an ulcer of the leg eight months before. He had had malaria at the age of 18, but denied having had syphilis. His occupation, that of packer and porter, entailed very heavy work.

There was notable pulsation in the right chest, most marked in the second interspace where it was expansile in character. In this region there was a large area of dullness and marked tenderness over the inner ends of the second and third left interspaces. Tracheal tug was present but the vocal cords were normal. Aortic systolic and diastolic bruits were heard. Urine normal. The diagnosis was aneurysm of the first part of the aorta. The patient was put upon iodide treatment and sent home after two months.

In March, 1928, 29 years later, he was readmitted under Dr. J. le F. C. Burrow with weakness, wasting, and anorexia of one year's duration. He had occasional vomiting and some difficulty in walking in the dark, and there had recently been some frequency of micturition.

Since his discharge from the infirmary in March, 1899, he had led a perfectly normal life. He had pneumonia in 1905 and made an uninterrupted recovery. With this exception he had been at work as a janitor during the whole interval of 29 years, and the only symptom he ever complained of was a slight unproductive cough. He was never short of breath. Of his two sons one was killed in the war; the other is married, and his wife's only pregnancy terminated in stillbirth. This son is himself in excellent health. The patient had been teetotal during the whole of the period.

On examination (March 24th, 1928) the apex-beat was normal. There was pulsation to the right of the manubrium with an area of dullness, an aortic systolic bruit, and an accentuated aortic second sound. Blood pressure was 106/80 mm. Hg, pulse 88–100, temperature normal, respirations 24. The blood Wassermann reaction was negative. The pupils were sluggish to light, knee-jerks sluggish, and ankle-jerks absent. A blood count showed red cells, 4,530,000; hæmoglobin, 50 per cent.; colour-index, 0·56; white cells, 9100. X ray examination revealed a very large aneurysm mainly in the right side of the chest, the wall of which appeared to contain calcareous material. The patient died one week after admission.

Post-mortem examination.—There was a large aneurysm of long standing with enormously thickened and partly calcified walls in the upper part of the chest. It was mainly median in position but extended rather more to the right than to the left. Roughly globular in form, it measured about 4½ in. from above downwards, 5 in. transversely, and 3½ in. in antero-posterior diameter. It was adherent in front to the chest wall, and its upper border was about 5 in. below the level of the thyroid cartilage. After fixation of the thoracic contents en masse a series of transverse sections were made. These showed that the aneurysm was of saccular type, springing by a rounded orifice rather more than ½ in. in diameter from a point near the junction of the first and second parts of the aortic arch. The outer part of the aneurysmal wall was densely calcareous, and the interior of the sac was largely occupied by dense laminated thrombus. The unobliterated portion, which communicated directly with the aorta by the aperture above-mentioned, measured approximately 2 by 2 by 1 in. The first and second portions of the thoracic aorta were much dilated and their walls grossly diseased, partly old syphilitic scarring but mainly atheroma with calcification. There was also early atheroma in the terminal 2 in. of the abdominal aorta.

There was a large malignant tumour (hypernephroma) in the upper part of the right kidney with involvement by direct extension of the right suprarenal and right lobe of the liver.

Careful examination revealed a doubtful scar on the penis, and there was an old tuberculous (?) lesion of the left wrist.

The case is a remarkable example of prolonged survival and continued good health in face of a large intrathoracic aneurysm. When the patient was first in hospital in 1899 it was quite clear that he had a large aneurysm probably of the first part of the aortic arch. A gloomy view of the prognosis was taken at the time, and he was sent home with very little hope of recovery. He lived for 29 years thereafter, and for nearly the whole of this period not only enjoyed good health but was able to continue in full work as a janitor. At autopsy there was no evidence that the aneurysm had itself contributed to the fatal issue. Though still present, it had enormously thickened walls with dense calcification in the outer layers. Death resulted from a hypernephroma of the right kidney with involvement of the adrenal and liver.

We beg to express our indebtedness to Dr. Barrs and Dr. Burrow for permission to make use of the clinical notes of this case.

A CASE OF ALCOHOLIC CIRRHOSIS

TREATED ON THE PRINCIPLE OF THE TALMA-MORISON OPERATION

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A woman, aged 52, was admitted to St. Andrew's Hospital, Bow, under my care on Dec. 31st, 1928.

History.—Her trouble began in the early months of 1928 with nausea, particularly in the morning, and loss of appetite. This was soon followed by morning vomiting and general lassitude. The weakness increased and she began to lose weight, noticing that her arms, legs, and face were much thinner. In May, 1928, she found that her abdomen had become swollen, the swelling increasing with great rapidity. She became progressively weaker and finally was unable to climb stairs. By December, 1928, she was confined to bed. She had spent the greater part of her life employed in a public-house and was a heavy drinker of spirits, imbibing approximately a bottle of gin daily. Her usual weight was 12 st. 3 lb.

On admission the abdomen was greatly distended, leaking a straw-coloured ascitic fluid from an umbilical hernia the size of an orange. There were distended veins coursing over the anterior abdominal wall and chest, limbs and body wasted, and feet cold and œdematous. The leaking rupture was acting as a safety-valve, and the patient discharged herself on Jan. 21st, 1929. Within three weeks she was readmitted having again become distended. Paracentesis abdominis was performed and 15 pints of straw-coloured fluid were withdrawn. In the following few months paracentesis was performed on seven occasions. She was now very weak and emaciated, her face was sallow and drawn, her eyes sunken, and the conjunctivæ were slightly jaundiced. Her weight was now just under 7 st. The last paracentesis had drained 21 pints, but within seven days she was again distended. She was also troubled with intractable diarrhœa.

This picture of alcoholic cirrhosis and associated gastro-enteritis fitted perfectly with the pathology of the condition, the portal or multilobular cirrhosis. The degeneration of liver cells and the formation of fibrous tissues surrounding and compressing the intrahepatic branches of the portal vein was attributable to the action of the alcohol in producing gastro-enteritis and consequent toxæmia, and to its direct action on the liver. This gradual obstruction of the

intrahepatic portal venules had given rise to congestion followed by ascites. The alcohol and the toxins produced by the gastro-enteritis perhaps also increased the flow of peritoneal fluid by irritation of the peritoneum—a form of aseptic peritonitis.

To aid the normal venous connexions between the systemic and portal circulations, an accessory venous circulation can be formed by producing adhesions between the greater omentum, liver and spleen, and the parietes, in this way overcoming the portal obstruction. With this end in view, operation was undertaken after full explanation of the risk entailed.

Operation.—An oblique incision was made from the costal margin at the lateral aspect of the left rectus and running downwards to the lateral aspect of the right rectus well below the umbilicus. The recti were well separated and the peritoneal cavity was widely opened. The fluid was drained and mopped away. The liver was approximately normal in size, its surface being irregular and covered by a thick white coating. There was perisplenitis and enlargement of the spleen. The surfaces of these were scrubbed with a hard hand-brush, as was also the peritoneum adjoining them. Hæmorrhage was severe. The greater portion of the gastro-colic omentum was brought through and buried between the posterior sheath and the recti. Suprapubic drainage was performed, a glass tube being used. The peritoneum was then closed by interrupted sutures. The tube was removed on the fourth day, the wound healed on the eleventh day. Three weeks later paracentesis was performed, 4½ pints draining. There was no further tapping.

On August 1st, 1929, the patient was readmitted with a strangulated umbilical hernia, the small intestine having slipped into the sac previously occupied by the fluid.

Second operation.—The small bowel was found to be gangrenous and enterectomy was performd, two feet of small intestine being removed with end-to-end anastomosis. The liver, spleen, and omentum were firmly adherent to the parietes. Hanging to the intraperitoneal portion of the omentum there were many mucoid pear-shaped globules the size of small grapes. Radical cure was performed for the hernia. Convalescence was uninterrupted and the patient discharged on the 23rd day.

From September, 1929, until Jan. 1st, 1932, the patient was at work daily, her weight being 12 st. 2 lb. She had occasional attacks of distension which passed off after a few days. She was taking two ports and two glasses of stout a day. Appetite and bowels normal. On April 27th, 1932, she was readmitted with the history of four months' jaundice. She had had an attack of hæmatemesis three days before admission. She was deeply jaundiced and there was bile and albumin in the urine. The pulse was feeble and irregular, the chest full of rhonchi and crepitations. Blood was found in the stools. Death occurred two days after admission.

Post-mortem examination.—The body was well covered, the skin deeply jaundiced. The liver was small, firm, deeply stained and shrunken, its surface being irregular with very little sign of any compensatory hyperplasia. The spleen was firm and enlarged, both organs being firmly adherent to the parietes. The greater omentum was firmly consolidated with the anterior abdominal wall. There was an acute gastritis with small erosions of the mucous membrane. The kidneys were small and granular. The lungs were congested and the heart was soft and friable.

The noteworthy features of this case are: (1) that the formation of widespread adhesions produced a permanent cure of the ascites in an advanced case; (2) that enterectomy was later successfully performed with normal healing of the intestine without production of the ascites; (3) that the hæmatemesis just prior to death was due to erosion of the stomach, not to rupture of the gastro-œsophageal veins; (4) that the spread of fibrous tissue encroached on the bile-ducts and led to an intrahepatic obstructive jaundice; (5) that there was very little sign of any compensatory hyperplasia of the liver tissue.

BRITISH MEDICAL ASSOCIATION

CENTENARY MEETING IN LONDON

SECTION OF PUBLIC HEALTH

THIS section opened with Sir GEORGE NEWMAN'S presidential address on the rôle of the private practitioner in relation to the progress of preventive medicine during the past 100 years and his influence on prevention at the present day.

The Practitioner and Preventive Medicine

Coincident with the passing of the Reform Bill, the growth of knowledge since 1832, he said, marked an epoch unequalled in any previous age. In the passage from central to local government and from aristocratic to democratic institutions, the resulting great social transition, as shown by the ultimate State control by the people, had led to the harvest of philanthropic effort in the cause of public health.

Two dominant factors were to be noted in that steady march of progress: firstly, the expansion of science and the application of scientific method; secondly, the habit of coöperation to which individualism had given place. In a review of the stages through which modern preventive medicine had passed, it was natural to dwell on the improvement brought about in their environment by the great sanitarians of the past in securing such benefits as the general use of pure water-supplies; the isolation of the sick; the removal of nuisances; housing reform; main drainage and the disposal and treatment of sewage; food inspection; factory acts; and vital statistics.

A feature of the inter-relationship of medicine and public health had been the endeavour of 18th century practitioners, Glisson, Sydenham, and others, whose example stimulated those who came after in the 19th century to search out the dependence of disease on environment, to introduce notification and the isolation of infectious disease. By their study of work in the factory began industrial welfare—to them likewise was due the reform of midwifery, and the inquiry into child sickness and mortality, and the establishing of the dispensary. It was by their support of vaccination that the principles of immunity became realised, and through them began British epidemiology.

As the study of anæsthetics had given surgery its great advance, so had new means of measurement and methods of physical diagnosis aided the physician in the differentiation of disease. There came to light too the importance of personal hygiene, and by the observations of notable pioneers, Richardson, Budd, and others, had been interpreted the association of certain infectious diseases with the means of spread, thus leading to their prevention, as in the case of typhoid fever, cholera, and tuberculosis. As the result of the new poor-law in 1834, there had been opened up the relief of the deplorable insanitary conditions then existing. By that step medicine had become preventive as well as curative, and thus some 4000 practitioners had been called upon to take part in the State service of the prevention of disease. The President traced the development of legislation from that time until 1911, when through the passing of the Insurance Act means of prevention as well as the treatment of disease were brought under the control of the practitioner. His advice and aid were now sought by the insured at the outset of illness, and much permanent and temporary ill-health was averted by timely measures. Prevention in the

liberal sense had been effectively encouraged by health insurance. Far from a "gulf" existing between preventive and curative medicine, too strong emphasis could not be laid on their close mutual relationship; they were so interdependent and complementary as to be inseparable.

Measles Prophylaxis

Prof. C. C. OKELL (London) opened a discussion on the attenuation and prevention of measles. He said that the knowledge requisite for checking much of the loss of life and disability due to measles had long been available, but little effort had yet been made to apply it in this country. Unfortunately next to nothing was known of the ætiology of the disease. Among animals only the monkey was at all susceptible, so that an immune serum could only be got from human beings, who had had the disease. Although some unexplained failures had occurred, the bulk of experience had lent support to the value of convalescent serum as an effective prophylactic, success being claimed in 80 to 90 per cent. of cases. For public health purposes the use of "adult" rather than "convalescent" serum would be much more convenient if it was found to be equally effective. Although in theory the amount of antibody became much reduced with lapse of time after an attack, there was, nevertheless, evidence that adult serum was of use. In the absence of a greatly needed central organisation to further the work, it was difficult to collect sufficient serum for extensive trial.

The donor experienced a tonic effect on the removal of 200–300 c.cm. of blood, and Prof. Okell described the apparatus he had devised for blood-letting.[1] The scheme he envisaged for the collection of serum on a large scale would possibly claim the services of a full-time medical officer; moreover, the treatment and preparation of the serum for human use demanded experience and technical knowledge. The present limited supply of serum should be reserved for children under the age of 4, who were not only more susceptible but also far more easily protected than older children. While passive immunity could be given for a short period, subsequent exposure to infection might still determine an attack. The general belief that measles could be modified by doses of serum insufficient to prevent the disease could not be accepted without more conclusive evidence, since sometimes trivial attacks occurred in untreated children. Prof. Okell suggested as points for discussion whether the completely protected child might still be infectious to others, and whether sterile human serum injected into children ever gave rise to local reactions.

Dr. DAVID NABARRO (London) said that human convalescent serum had proved far more reliable than any animal serum, and gave protection in over 95 per cent. of cases. More extensive preparation and wider use of the serum was desirable. The difficulty of obtaining a sufficient supply of serum had been met elsewhere and could be overcome in England, especially if adult serum proved of value. He preferred to collect convalescents' blood at 7 to 14 days after defervescence. The dosage ranged from 3 c.cm. for patients under 1 year, increasing by 1 c.cm. for each year up to 7 c.cm. for those over 5 years, 10 c.cm. at 10 to 12 years, and 12 c.cm. for adults. Except for a few cases in older children of transient erythema and rise of temperature to 100° or 101° F., the effects from injection of properly prepared serum were not to be feared, and being of human origin, the serum did not cause anaphylaxis or reactions. Its use, however, in young infants under 6 months was not advised; they were not usually susceptible, and injections might cause rise of temperature and malaise. If complete protection was desired, with passive immunity for two to four weeks, serum should be given on or before the fifth day of incubation; but if a mild or modified attack, with subsequent lasting immunity, injection should be given between the sixth and ninth days of incubation. The so-called "sero-attenuation" was much to be preferred, as the condition might be apyrexial with only transient rash, and it was probably non-infective unless there was coryza or bronchitis; whereas the passive immunity by "sero-prevention" was so short that further protection became necessary during an epidemic. After the ninth day of incubation, protection by serum could not be expected, and serum treatment of measles during attack was of no value. Dr. Nabarro strongly emphasised the need for official action in arranging for preparation and distribution of serum on a sufficient scale.

Dr. WILLIAM GUNN (London) pointed out the importance of study of the epidemiology and clinical features of measles, combined with inquiry into the conditions calling for the use of serum prophylaxis, as well as machinery for a survey of case records, if a just estimate of the value of any special line of treatment was to be made. Exact deductions from statistics on measles morbidity were not possible in the absence of compulsory notification of the disease. He referred to the change of attitude to infectious disease in the past 30 years as an epitome of the history of the reaction of the human race to such disease. The sacrifices and libations of our ancestors, who fled to escape an epidemic, closely corresponded to the rites observed only in recent years in the pouring out of carbolic and burning of sulphur in the belief that thus spread of infection would be averted. In was in 1920 that public health authorities gave up purely preventive measures of control, realising that an epidemic would continue so long as there was susceptible material remaining. Attempts were now made to postpone attacks until a later age or season was reached, to provide medical and nursing supervision in the home, and hospital treatment for severe cases. Dr. Gunn described his experiences in serum prophylaxis in the 1927–28 and 1929–30 measles epidemics. After trying many sera he regarded convalescent human serum as the only prophylactic to give uniform results free from harmful effect.

He gave the serum in minimum doses of 5 c.cm. to all cases. The dose was increased according to age, the number of c.cm. being twice the years of age. Intramuscular injection soon after contact with infection and before the fifth day gave complete temporary protection; the same dosage given between the fifth and ninth day resulted in an attenuated attack.

In the course of five ward outbreaks at the Western Hospital, the last hundred contacts had thus been completely protected. Further controlled investigations were required before accurate conclusions could be formed on the effect of serum prophylaxis. Steps were now being taken to ascertain the value of adult serum, and, if this proved satisfactory, it was proposed to arrange for the pooling of serum from volunteers in order to furnish a supply for use in hospitals and private practice. It was necessary to take care to select donors who had really had measles.

A total of over 24,000 c.cm. of adult serum had been obtained, averaging over 100 c.cm. per donor, and over 2000 doses had been issued to L.C.C. general and special hospitals since December, 1931, and to children's homes and residential schools since March, 1932.

[1] See THE LANCET, Sept. 3rd, p. 514.

Results of administration of adult serum in hospitals and residential schools had shown that 77·2 per cent. were completely protected, and that 17·3 per cent. had attenuated attacks; in 2·9 per cent. there was no reduction in severity. Of those under 3 years, 81·2 per cent. were protected; at 3 to 5 years 69·2 per cent.; and at over 5 years the protection rate was 89 per cent. In children's homes and residential schools 85 per cent. of those injected were protected; 14 per cent. had modified attacks; and 1 per cent. showed no result from injections.

A full account of the work of preparation of material and the procedure adopted would appear in the report of the Medical Officer of Health for London on the measles epidemic of 1931–32.

Dr. Gunn's personal impression was that though convalescent serum yielded better protection than adult serum in the doses given, there was little to choose between the two when modification of the attack was desired. The dosage of adult serum advised was double that of convalescent serum—namely, a minimum of 10 c.cm. increased according to age. As to the points raised by Prof. Okell, antibacterial serum and normal horse serum both had some relieving effect in measles, as also in acute respiratory affections. The carrier state was unknown in measles and the contact without clinical attack did not appear to harbour the virus. A modified attack, in which the patient had less catarrh, was less likely to convey infection than a normal attack; but, when transmission did occur, the disease bred true and might give rise to quite severe attacks. Although French writers had recorded severe reactions following measles serum injection, he had never observed more than vague local tenderness and occasional slight pyrexia on the evening of injection—which he regarded as probably of psychic origin.

Dr. T. M. HUNTER (Glasgow) said that in the Glasgow epidemic of 1931–32 nearly 3000 c.cm. of serum were procured from 54 donors, who had become available when the epidemic was well advanced during November, 1931. Collection was made on the seventh to tenth day of normal temperature, and after treatment with trikresol, the serum was stored in an ice-chest. Disregarding certain doubtful cases there remained 233 contacts who had received convalescent serum. Of these, 185 had escaped attack, yielding 80 per cent. completely protected; 36 had had attenuated attacks. Eight had had "mild" attacks—i.e., slightly more definite than the attenuated form—and four developed "classical" measles; but as the rash had developed at one to five days after injection, the serum had been too late for prevention. Out of 32 control contacts, not given serum, 23 got typical measles.

Dr. Hunter then discussed the various factors bearing on the investigation, the day of injection of serum, the age of the serum used, the age of injected child, the amount of serum given, and the duration of immunity. He believed that the best use to make of convalescent serum was not to give temporary prevention by large doses, but by the 5 c.cm. dose to change a possible fatal attack into a modified one without complication, and thus to ensure lasting immunity.

DISCUSSION

Sir GEORGE NEWMAN contrasted the encouraging constructive work of the last few years with the previous helplessness experienced in dealing with measles. There were formidable administrative difficulties in the way of a rapid adoption of measles prophylaxis but steps were, however, being taken in the Ministry of Health to help forward the movement.

Dr. J. I. COLLIER (London) described the important part played by the general practitioner who first saw the case and treated it. The patient was only sent into hospital if complications arose. Of the 60,000 cases of measles in the 1929–30 epidemic, 6000 were treated in hospital and of those about one-third were admitted with complications. The hospitals were, he said, really treating only the complications of measles and not the disease itself. Since serum was of use only before the ninth day of incubation, every case of measles seen in private practice, at the stage when diagnosis was possible, was too late for serum treatment. There was, he thought, much guesswork in the immunisation of contacts, for which 95 per cent. protection had been claimed.

In a series of 7000 children at the High Wood Hospital in ten years, there arose 16 primary cases of measles, and though no active preventive measures had been taken, only five contacts were subsequently attacked. If all the hundreds of susceptible contacts had been given serum as advocated, almost 100 per cent. protection could have been claimed. Dr. P. Stocks had shown that under the best conditions serum prophylaxis could only reduce an epidemic by 13 per cent., and the conditions governing even that small percentage, Dr. Collier stated, were hopeless in practice. From Dr. A. Hoyne's good results with amidopyrin, which he had himself confirmed both in practice and in hospital, he regarded the use of the drug in the pure state as the most valuable method of treating and attenuating measles. Whilst convalescent serum in ward outbreaks was of value for ensuring a modified attack, and only exceptionally for producing protection, Dr. Collier held that it had no value in the control of epidemics.

Dr. A. S. M. MACGREGOR (Glasgow) confirmed Dr. Hunter's impressions of the value of prophylactic serum in Glasgow. There was, he said, adequate supply of serum in Scotland, as most adults had had the disease and readily supplied their sera.

Dr. C. KILLICK MILLARD (Leicester) showed charts of measles and whooping-cough mortality in Leicester during the past thirty years, demonstrating the marked fall of the quinquennial average mortality from measles since 1917 in contrast to the continued high mortality from whooping-cough.

Dr. W. G. SAVAGE (Somerset) said that in Somerset also there had been a fall in measles but not in whooping-cough mortality. He advocated measures directed to delaying or attenuating the attack, as there was little chance of preventing measles. For those under 5 years, the most exposed to the severe type, protection against early attack and postponement till after 7 years should be the objective.

Dr. D. S. SUTHERLAND (Manchester) said that voluntary donors receiving a fee of three guineas for collection of serum should previously be examined by the public health department for verification of diagnosis to avoid the chance of their having had only rubella.

Dr. R. A. GLEGG (East Sussex) urged the necessity of active health instruction and propaganda by health visitors as a means of obtaining offers of convalescent serum.

REPLY

Prof. OKELL stressed the importance of more analysed statistics. The evidence in favour of convalescent serum should be marshalled by a statistician. Although the control of measles on a large scale was, he felt, quite impracticable, the demands for serum were often most urgent. There was need of an emergency scheme even for a limited supply.

Mental Capacity of Children in Relation to Environmental Conditions

Dr. J. RIDDELL (Stirling) gave the results of an investigation undertaken amongst over 1600 Falkirk and Stirling children, including a group of 955 of 9 years (479 boys and 476 girls) and another group of 683 of 13 years (346 boys and 337 girls). The groups of children were arranged in four categories according to mental capacity—advanced, normal, retarded, and very retarded. Among the advanced were a number of bright children with defective speech; and among the very retarded, a large percentage had visual defect or defective hearing. In estimating as to whether a child was fit for a school class, and was suitable according to age, information was supplied by the school teachers and headmasters. It was noted that in the course of their school life girls moved more quickly from lower to higher classes than boys. With regard to observations on environmental conditions, and the study of other points in relation to mental capacity, attention was given to the influence of the following factors:—

(1) *School attendance.*—As to the effect of lateness in going to school; the changing of schools; and irregular attendance. Children in the 9-year group were found to suffer more materially by irregular attendance than those in 13 year age-group and more so among girls than boys. The children of parents of sedentary occupation attended better than those who followed more active employment.

(2) *Nutrition.*—There was a steady decline in height and weight of children to be noted in passing down through the various divisions of mental capacity—i.e., retarded children were smaller and lighter than their fellows.

(3) *Rest in bed at night.*—Little reliable information was forthcoming which could be satisfactorily correlated with effect on mental capacity.

(4) *Environment.*—There was a definite tendency for an increased percentage to appear in the retarded groups of children who also lived in overcrowded conditions—i.e., more than two persons living in one room—whilst those living in less crowded conditions were in a minority among the retarded children.

(5) *Occupation of parents.*—There were more children of manual labourers in the retarded classes where the children were also the most dirty and ill-clothed. On the other hand there were more children of parents with sedentary occupation in the advanced classes; they were also taller and heavier than those whose parents were engaged in manual work. The dull child was to be found among the manual labouring class, living in only one or two apartments, whereas the cleanly child of good mental attainment was more common among the sedentary workers.

(6) *Physical defects.*—All pulmonary and organic cardiac defects tended to cause mental retardation, whereas minor defects, such as enlarged tonsils and adenoids, were found to have apparently little influence.

From the results of his investigations Dr. Riddell concluded that conditions of home environment and nutrition must be regarded as important factors affecting the mental capacity of children.

SECTIONS OF RADIOLOGY AND MEDICINE

AT a combined meeting of these sections the chair was taken by Prof. A. J. HALL (Sheffield), and Dr. STANLEY MELVILLE opened a discussion on

Radiology in Diseases of the Lungs

The place of radiology in lung disease was, he said, now supremely important. As Salusbury MacNalty had said, the pendulum has swung too far and some enthusiasts diagnosed pulmonary tuberculosis solely on X ray evidence, ignoring orthodox physical examination. Definite infiltration could be demonstrated upon a film at an early stage, often before definite physical signs were present, and consistently negative evidence for some months proved the absence of pulmonary tuberculosis. When physical signs were present the pictures usually showed much more extensive disease than the physical examination. As a result of long experience at the Brompton Hospital Dr. Melville believed that in a vast majority of cases the bacillus entered the lung by aspiration, and that any further invasion in the adult was exogenous. In the infant the result of infection depended upon the initial dosage and the degree of resistance, varying from rapidly fatal caseous broncho-pneumonia to a primary focus in the lymphoid tissue round the smaller bronchi. The resulting response in the tracheo-bronchial glands might calcify or might caseate or burst into a bronchial blood-vessel, leading to an aspiration infection or a miliary tuberculosis. The focal reaction to a tuberculous gland might be quite evanescent, or might persist or recur. There was usually some pyrexia and malaise and the infant reacted positively to tuberculin. The skiagram showed a wedge-shaped area extending from the inflamed gland into the surrounding tissue. After a time this area disappeared, and the diagnosis of "pulmonary tuberculosis" was not justified.

Dr. Melville pressed for the general adoption of the word "infiltration" as describing a parenchymatous invasion by the tubercle bacillus, and for the wider use of the term "fibrosis" to describe a condition of healing in which there was definite deviation of the mediastinal content to the affected side. Expressions such as "active" or "healed" should, he urged, be used with caution if at all, as such conditions were clinical rather than radiological. The advantages of the upright position for chest radiography were that fluid levels could be seen and the early screening could be done and the tube racked out for long-distance radiography without moving the patient. The disadvantages were that it was not possible to centre the tube with such accuracy as to obtain an identical picture months or even years later; that it was impossible to deal with an ill patient; and that the female breast threw a much more obstructed shadow in the upright than in the recumbent position. At the Brompton Hospital the difficulty had been solved by cutting a hole in the floor. Dr. Melville showed slides illustrating this apparatus.

PULMONARY TUBERCULOSIS

Dr. R. A. YOUNG said that radiology had become important not only in diagnosis but in the estimation of the extent of the disease and in its treatment. Exaggerated claims made on its behalf were not infrequently the fault of the general practitioner or the physician, who sometimes made unfair demands. To suggest that radiological examination should replace clinical examination was a harmful and unfortunate attitude. Radiological evidence was only one form of physical examination, complementary to ordinary methods and not competitive with them. Careful clinical observations had never been more necessary or helpful, but unfortunately patients shared with the public a deeply implanted belief in instrumental and laboratory investigation, forgetting the presence of the human element and instrumental error. The value of radiological information must depend upon the efficiency of the apparatus and the experience of the person who interpreted the films. The clinician should not ask a radiologist to report on a case of which he did not know the clinical features and history; nor to exclude tuberculosis on one examination. When tuberculosis was suspected it was necessary to collect as much evidence as possible; the history should be taken very fully and was often the best pointer to the diagnosis, especially

if a temperature record was available. Dr. Young said that he often re-examined the patient with the film in view. The more experience the radiologist had of chest work, the more guarded were his reports, but if he were taken into consultation over the clinical features he could often give fruitful explanations of what was obscure. There was need for much greater relation between radiographic appearances and post-mortem findings than existed at present before films could be interpreted in pathological terms, or conclusions could be drawn concerning the onset of tuberculous lesions in the chest. The speaker said he was very reluctant to describe multiple rounded shadows as miliary tuberculosis without some clinical support. He disliked the term "infiltration" and preferred to use the word "deposit," qualified by "old" or "recent." He supported Dr. Melville's plea for a standardised form of a report and for agreement on nomenclature. Radiology gave more help in assessing the extent, age, and character of the lesions, than on their ætiology or their quiescence or activity. It gave valuable information on the state of cavities, the presence of effusions, and the displacement of heart, trachea, or diaphragm.

BRONCHIECTASIS AND LUNG ABSCESS

Dr. F. G. CHANDLER said that radiology had shown no more dramatic developments than in these two conditions. With lipiodol the existence, extent, and position of non-obstructive bronchiectasis could be proved and the integrity of the opposite side could be tested. The bronchiectatic area might escape the oil, and careful technique and critical evaluation of the pictures was needed. Radiology also helped in showing the chronic atelectatic lobe and the degree of diaphragmatic rise after phrenic evulsion and of collapse in artificial pneumothorax.

The radiographic picture alone might serve to differentiate abscess from bronchiectasis and new growth by showing a fluid level, but sometimes it only showed a diffuse obscured area. Lipiodol usually stopped short at the periphery of the affected area, but sometimes flowed into the abscess cavity. The distinction between abscess and breaking-down growth might be difficult if radiography were too long delayed. It was said, however, that iodised oil showed a more conical shape at the site of obstruction with a growth than with an abscess. It was rare for the patient with an abscess not to cough up pus, but in a malignant abscess there might be complete obstruction even though an enormous abscess was present. Neither lipiodol nor the position or pattern of the shadow, nor the failure to expectorate the pus, nor bronchoscopy could be relied on in all cases, and diagnosis might be a matter of clinical judgment. In any doubt it was better to operate, and exploratory thoracotomy must be added to the list of diagnostic procedures. Accurate localisation was essential for the successful operative treatment of lung abscess and was usually impossible without radiography. Antero-posterior and lateral views must be taken, but stereoscopy was of less value in this condition than in others.

COLLAPSE TREATMENT

Dr. L. S. T. BURRELL stressed the importance of coöperation between the clinician and the radiologist, and said that the radiologist should have clinical knowledge of the patient, because even with the most careful radiological examination it was sometimes difficult to detect where the pneumothorax was. There was a tendency to conduct pneumothorax according to the radiographic findings; while the radiogram had great value the condition of the patient and his symptoms were even more valuable. Patients who had been treated some ten years ago when the position of the mediastinum had been ignored had done extremely well. Nowadays, guided by the radiogram, it was common to give very small refills, and the pendulum had swung a little too far. He advised the use of the radiogram to show whether there was any danger of adhesions forming; and the extent and rate of collapse and expansion. Adhesions could only be localised by radiology, and before introducing a thoracoscope and cautery it was necessary to get a definite localisation by rotating the patient. The dangers of thoracoplasty had been reduced, but before it was performed the clinician should see a radiogram of the lungs, especially of the opposite lung. An indispensable guide to the probability of success was furnished by the condition of both lungs. It was dangerous to raise or lower pressure by oleothorax entirely on the radiological findings.

LIPIODOL

Dr. J. DUNCAN WHITE (Edinburgh) said that lipiodol might be injected by one of four routes: supraglottal, through the cricothyroid membrane, trans-nasal, or by the bronchoscope. The route of choice depended on the particular case and the manipulative skill of the operator; moreover, many patients would be suffering from cough and expectoration, and in these patients it was often very difficult to inject anything into the air passages. The preliminary radiogram, which was essential, would show which part of the lung tissue required investigation, and this knowledge might determine the choice of route. The speaker said that he preferred the supraglottal route for routine purposes; the patient must realise that he could breathe perfectly easily with the mouth open and the tongue protruded. The less the display of equipment, the easier the examination. Properly carried out, the injection through the cricothyroid membrane was quite safe. If, however, the radiogram showed that the most pronounced lesions were in the upper lobe, the trans-nasal route was indicated: the patient should be arranged on the radiographic couch in the partial Trendelenburg position. If the bronchoscope was being used, the oil should be injected through it, but as a route its use was unnecessarily severe.

Lipiodol was invaluable in bronchiectasis, as it would show up the general cylindrical dilatation of the basal bronchioles. Dr. White said that he had been unable to observe the differentiating point which Dr. Chandler had mentioned between bronchial abscess and bronchial stenosis due to neoplasm. Before any treatment for lung abscess was carried out it was essential that the extent of the bronchitic change should be determined. Lipiodol would often show secondary bronchitis in the contralateral lung when clinical methods had failed to detect it. Finally, it would often give valuable information of the progress of healing in artificial pneumothorax, phrenicotomy, or thoracoplasty, and would show the size of the cavities before treatment. In chronic empyæma it would determine the extent of the sinuses, particularly when they extended below the level of the diaphragm.

DISCUSSION

Dr. E. W. TWINING (Manchester) spoke of the necessity for standardisation of technique and of nomenclature. There was a demand, largely from public authorities and silicosis committees, for films which were strictly comparable one with another.

Standardisation should not be overdone; a film which showed abundant lung detail was not necessarily the best for mediastinal lesions. He preferred a film where the bifurcation of the trachea and the left bronchus could just be distinguished. There was a tendency to over-softness and under-exposure by enthusiasts apparently anxious to record hypothetical infiltrations. The radiologist should not adopt such terms as "exudative," "productive," or "cavernous" foci without verifying their meanings in the post-mortem room. A series of films so verified was a priceless heritage. These were some of the terms which had been evolved in Germany on the basis of post-mortem findings, and they deserved recognition. He condemned the idea that a small, barely visible focus might develop into a spreading tuberculous lesion. Tuberculosis advanced by a series of catastrophes, each involving a considerable extent of lung, and the smaller a lesion was the less likely was it to be early.

Dr. J. V. SPARKS showed several sections of typical asbestosis bodies. The radiographic examination, he said, was very important in conjunction with a comparative examination on previous data; many firms had their employees radiographed on engagement. In advanced cases the diaphragm movement was limited and the outline was indistinct and sometimes uneven, with clouding of the costo-phrenic angles and thickening of the pleura. The relative scarcity of visible change did not mean that the condition was less severe than silicosis.

The PRESIDENT paid tribute to the efficiency of the work on silicosis in Johannesburg and the close coöperation there between radiologists and physicians.

Prof. LYLE CUMMINS (Cardiff) described silicotic lung changes and illustrated them with slides, some from South Africa.

Dr. W. R. F. COLLIS traced the development of primary tuberculosis according to the German interpretation. After a six weeks' incubation period some reaction to tuberculin was noted, the "paratubercular" signs appeared and signs of hilus tuberculosis could be seen in the radiograms. Swellings in the hilar glands were seen in about 30 per cent.

Dr. MELVILLE replied.

SECTION OF ORTHOPÆDICS

Mr. R. C. ELMSLIE (London) presided over the session of this section when Mr. HARRY PLATT (Manchester) opened a discussion on

Colles's Fracture.

He considered that this fracture was of outstanding importance. In a series of 835 recent fractures of the lower end of the radius at Ancoats Hospital, 571 were Colles's fractures, 174 were separation of the radial epiphysis, and 90 were styloid and marginal fractures. Mr. Platt gave an account of the early papers and monographs on Colles's fracture, and proceeded to discuss the question of impaction. Stevens, of Boston, had recently put forward the view that the fracture was a true compression injury in which there was a crumpling of the posterior cortical surface, without any actual telescoping of the fragments. The fracture was common at all ages and in both sexes. It was commonly due to a fall on the outstretched hand. The line of fracture was transverse and lay within an inch of the articular surface of the radius, at a site where the bone was ill-fitted to resist a cross-breaking strain. Some displacement was present in not less than 75 per cent. of cases, but gross displacement—that is, the dinner-fork deformity—was relatively uncommon. The displacement might be only a backward tilt, with no displacement en masse, or the fracture might be comminuted. Involvement of the radio-ulnar joint, without alteration of its alignment, was not significant, but fracture of the ulnar styloid, or detachment of the triangular fibrocartilage, might interfere with the recovery of the function of rotation. In diagnosis, the loss of the normal anterior concavity of the wrist was the measure of the backward tilt; this was the important point to determine by inspection, palpation, and radiography. For anæsthesia, two satisfactory methods were available—viz., nitrous oxide anæsthesia, and local anæsthesia by injection of 20 per cent. novocain. The ideal conditions for local anæsthesia were a fracture of some hours' duration, presenting a hæmatoma on the dorsum of the wrist, into which the novocain could be easily and rapidly diffused through a single puncture.

The method of reduction he advocated was a combination of traction with direct force. The traction with hyperextension of the wrist disengaged the fragments. Direct pressure was then exerted on the fragments. Finally, traction combined with palmar flexion and adduction was used to overcome the radial deviation. The reduction was complete only when the lower articular surface of the radius looked downwards and forwards. The position for fixation was one of slight palmar flexion with the hand slightly adducted. The correct splint controlled the extensor surface of the forearm and hand as far as the metacarpo-phalangeal joints. Splinting of the flexor surface was of subsidiary importance. He advocated gutter splints of light metal, or moulded plaster-of-Paris splints.

Fractures without displacement could be treated by a short period of fixation and early mobilisation of the wrist, and of the inferior radio-ulnar joints. Five weeks were ordinarily required for firm consolidation, and the backward tilt might reappear during the first three weeks. After a prolonged trial of the method of treatment by early massage, he had decided that the main disadvantages of the method were the time and energy consumed, and the danger of recurrence of the deformity during massage, in spite of the most careful supervision of the massage students. He now advised a period of fixation lasting five weeks, with active use of the limb in the splint, but no removal of the splint for physico-therapeutic treatment. Certain patients were referred to the massage department at the end of the five weeks. Out of 111 cases treated at Ancoats Hospital during 1925 to 1928, only 3 showed bad results; 92 showed excellent and perfect results, the remainder (16) being classified as good, but not perfect.

Sir WILLIAM WHEELER (Dublin) said that Colles's work was all the more notable because his descriptions were based entirely on clinical observations. He never saw a dissection of a Colles's fracture. The method of applying tight-fitting plaster splints directly to the limb, as taught by Böhler, of Vienna, should be advocated with some caution. He had seen the loss of an arm and of a leg by the use of this method. The students in Dublin had heard so much of the method that one student, shown an X ray of a fractured skull, suggested treatment of the case in a bowler hat. Sir William suggested that slight deformity of the wrist might be consistent with a good ultimate functional result.

Mr. W. A. COCHRANE (Edinburgh) said that one of the most important points to remember throughout the treatment of these fractures was that the radius was the hand bone. The apparent forward displacement of the ulna seen in some cases after treatment was the outcome of a failure to reduce the backward rock of the radius. There was a rotation displacement of the lower radial fragment on the upper, which could best be reduced by pressing on the ulna, as described by Cotton, and using it as a fixed point round which the lower radial fragment was wound.

Mr. Cochrane emphasised the importance of the hæmatoma in the fracture, and suggested that injection of a local anæsthetic into this hæmatoma might conceivably interfere with bone regeneration. This possibly accounted for the fact that at clinics using local anæsthesia as a routine considerably longer times were allowed for firm union of fractures, and consequently for immobilisation, as compared with those using general anæsthesia. Safety in splinting, he said, was of the utmost importance. Skin-tight plasters should be applied only by specialists; they were very dangerous in inexperienced hands.

Mr. H. A. T. FAIRBANK (London) said that he had found slight degrees of lateral displacement difficult—in some cases impossible—to overcome. Of all the displacements, the backward tilt was the most important to remedy. The type of splint did not matter. He, personally, found Carr's splint, with a wedge-shaped felt pad lying in front of the lower fragment, satisfactory. He reserved plaster splints for the difficult cases with late reduction and comminution. Massage and early mobilisation were used for fractures in old women. He thought stiff fingers were the worst problem met with in these fractures.

Mr. WHITCHURCH HOWELL (London) stressed the dangers of plaster-of-Paris splints, and the dangers, when using nitrous oxide anæsthesia, of the recurrence of deformity after reduction caused by sudden movements of the patient. He advocated fixation in supination. Stiff shoulders after Colles's fracture were due to injury to the shoulder at the time of the fracture.

Mr. G. E. WILSON (Toronto) said that one of the most useful ways to look on Colles's fracture was as a shortening of the posterior surface of the radius. He thought the cases of recurrence of backward deformity after reduction were more apparent than real. The swelling of the soft parts masked a poor reduction, which became obvious about the second week when the swelling had disappeared. He tested for full reduction by palmar flexion. If this was possible to a right angle, reduction was complete. He reduced fractures under the fluoroscope, and fixed the fracture in a plaster splint in adduction for two and a half weeks.

Mr. GEORGE PERKINS (London) said he taught students to test for deformity of the anterior curve of the radius by palpation of the radial artery at the wrist, as in feeling the pulse. He also taught them to use anæsthesia in every case requiring reduction. The shortening of the radius led to lack of alignment at the radio-ulna joint. For this he advocated Baldwin's operation in severe cases.

Mr. F. CROOKS (Nottingham) said he had been taught as a student to use posterior splints; he advocated brachial plexus anæsthesia for reduction, and deprecated too early removal of splints.

The PRESIDENT said that certain principles were taught to masseurs, namely: (1) Colles's fracture is not united in a fortnight; (2) it is possible to redisplace the fracture by early massage; (3) that the masseur should act mainly as a stimulus to the patient, to encourage use of the limb. He liked the plaster slab splint, and thought its correct use should be taught to every student.

Mr. PLATT, in reply, agreed with Mr. Perkins that gross disalignment of the inferior radio-ulnar joint was a serious disability. In reply to Mr. Wilson, he said that he reduced his fractures by palpation, and checked the result by radiography. He did not use the fluoroscope. The stiff fingers, referred to by Mr. Fairbank and others, he thought were not due to ischæmic paralysis, but were neurotrophic in origin, possibly being caused by an irritation of the posterior interosseous nerve at the back of the fracture.

SECTION OF PATHOLOGY

WITH Prof. J. WALKER HALL (Bristol) in the chair, a discussion on

Cholesterol Metabolism in Disease

was opened by Mr. J. A. GARDNER, F.I.C. (London). Cholesterol, he said, was a constituent of all animal cells and body fluids; in health the urine contained mere traces, but in nephrosis there was considerably more. Cholesterol existed in two forms in the body, (1) free, (2) combined with the higher fatty acids as esters; and these forms were not equally distributed. The pathologist was interested in cholesterol because of the variations of the amount in the blood in disease; thus there was hypercholesterolæmia in some forms of nephritis, some cases of cholelithiasis, of diabetes, &c. Physiological increase of blood cholesterol also occurred, for example in pregnancy. Secondly, pathologists were concerned with the deposits of cholesterol or of cholesterol esters in the tissues, for example, those in the normal suprarenal cortex, in atheromatous intima, in inflamed kidney, and in other organs. Cholesterol inhibited the hæmolytic action of saponins. By prolonged feeding, cholesterol infiltration of tissues could be produced in rabbits, and changes were produced which had been believed to resemble pathological processes in man.

During the past 20 years chemical had been acquired more rapidly than physiological knowledge. Due mainly to the brilliant work of A. Windaus and H. Wieland, it had been shown that there was an intimate chemical relationship between cholesterol and the bile-acids, and tentative structural formulæ had been assigned to cholesterol, to the bile-acids, and to their products. Mr. Gardner gave the following scheme to illustrate the relationships between the different substances:—

(Parent hydrocarbon)	Cholestane		Coprostane
	↓		↓
(Unsaturated alcohol)	Cholesterol	⇄	Allocholesterol
	↓		↓
(Saturated alcohol)	β-cholestanol		Coprosterol
	↓		↓
(Bile-acid)	Hyodioxycholic acid		Cholanic acid and hydroxy derivatives.

In vertebrate animals the only unsaturated alcohol isolated from tissues was common cholesterol; recently it had been shown that this was generally accompanied by 1 to 5 per cent. of β-cholestanol. From the bile of different animals, on the other hand, many different bile-acids had been isolated, and when

similar bile-acids were found in two species their proportions might be very different; consequently the results of animal experiments were not necessarily applicable to man.

There was little or no precise information, Mr. Gardner said, as to the functions of cholesterol in the body. In man, analyses had been made of the blood, of the excreta, and of tissues obtained post mortem. Before attempting to assess the meaning of the results of such analyses in disease, it was necessary to review the origin and fate of cholesterol in the body. From their own work and that of others up to that time Dr. Dorée and himself had some years ago formulated the following working hypothesis:—

1. Cholesterol is a constant constituent of all cells, and when these cells are broken down the cholesterol is not excreted, but is used in the formation of new cells.

2. The liver breaks down dead cells—e.g., blood corpuscles—and eliminates their cholesterol in the bile.

3. The cholesterol is reabsorbed from the intestine, probably as esters, together with bile-salts, and is carried in the blood for reincorporation in new cells. The destruction of red corpuscles is now attributed to the reticulo-endothelial system in general.

It had been shown by experiments on dogs that cholesterol was readily absorbed from the intestine and transported in the chyle. Bile-acids had the property of uniting with substances insoluble in water—e.g., fats, fatty acids, cholesterol—to yield compounds whose salts were soluble in water—the "choleic acid principle" of Wieland—thus affording an explanation of the transport of such substances through the intestinal wall. It had been shown that cholesterol could be synthesised in the body, but the seat of such synthesis had not been clearly established. In the adult more sterols were excreted in the fæces than were taken in with the food. Further, it was clear from observations on isolated portions of human intestine that sterols could be excreted into the bowel as well as in the bile. The main sterol of adult fæces was coprosterol, which was believed to be produced from cholesterol by reduction due to the action of bacteria. In milk-fed infants the fæces contained cholesterol, but not coprosterol; the stage at which the reduction to coprosterol started was not known. The influence of feeding animals with cholesterol, or cholesterol-rich diets, varied in different animals as regards the possibility of producing aortic changes. The experiments were most successful in rabbits, much less in rats and mice, and negative in dogs and cats. Mr. Gardner concluded that in man there was no real evidence pointing to any connexion between atherosclerosis and exogenous cholesterol metabolism.

BLOOD CHOLESTEROL

In about 50 healthy individuals of both sexes the total cholesterol of the fasting plasma varied from 0·08 to 0·23 per cent., of which from 60 to 70 per cent. was in the form of esters. There was no such thing as alimentary hypercholesterolæmia after a meal; the plasma cholesterol sometimes rose and sometimes fell during the hours succeeding the meal. At the same time prolonged feeding with diets of high cholesterol content eventually raised, and of low cholesterol content eventually lowered, the pre-breakfast level of the plasma cholesterol. Some cases of pregnancy showed an increase of the total cholesterol, and many more exhibited variations in the ratio of free to ester cholesterol.

In uncomplicated cholelithiasis without jaundice there was no hypercholesterolæmia, and the ratio of free to ester cholesterol was normal. With biliary obstruction there was generally a fall in the ester cholesterol; the same picture was found in subjects with biliary fistulæ; it looked therefore as though the absence of bile from the intestine in both groups reduced the absorption of sterols, and so lowered the ester cholesterol content of the plasma. In a minority of cases with cholelithiasis and obstructive jaundice there was hypercholesterolæmia, with an increase of both free and ester cholesterol; the explanation of this was not clear. The hypercholesterolæmia of nephrosis might reach as much as 1 per cent. total cholesterol, and the ratio of free to ester cholesterol varied in either direction. Its cause was not known, but it might be related to the disturbance of the plasma proteins. The total cholesterol of the plasma might also be raised in myxœdema. In both myxœdema and nephrosis the basal metabolic rate was lowered, but it was not fair to regard the blood cholesterol as inversely proportional to the basal metabolic rate, because in hyperthyroidism the increased rate was accompanied by a normal plasma cholesterol.

Mr. Gardner concluded by referring briefly to the histological study of pathological deposits of cholesterol esters in tissues, as in chronic nephritis, Niemann's disease, atherosclerosis, and xanthoma. Some of these deposits were attributed to hypercholesterolæmia, but others were not associated with an increase of the blood cholesterol. Conversely, the hypercholesterolæmia of nephrosis did not lead to xanthomatous deposits.

EXPERIENCE IN FREIBURG

Prof. LUDWIG ASCHOFF spoke particularly of vascular disease. The anisotropic droplets in the intima of pathological vessels definitely contained cholesterol esters. In atheroma of the aorta fats, phosphatides and cholesterol compounds were all in excess; but the last group of compounds were in greatest excess; the other two groups were not of much importance. The deposition of lipoids occurred first at the boundary between intima and media, probably in the cementing substance between the elastic fibres. The deposits then increased and spread towards the lumen of the vessel. Deposits in the media occurred later, and started at those points where the elastic fibres were loosely knit. It used to be thought that the changes were essentially intracellular, but nowadays atheroma was regarded as an imbibition process, the lipoids being derived from the blood plasma.

Changes in the vessels began in early childhood. The special pictures observed at different stages were due to the superimposition of special circumstances at the different stages of life. Thus in early life the picture was one of simple imbibition of lipoids. In later life there was in addition a reactive hyperplasia of the intima. Such factors as wear and tear, necrosis, and calcification were also added with increase of years. It was tempting to speculate on the main influences at different ages. Thus might the high cholesterol content of milk be responsible for vascular changes observed in babies? Was the atheroma of puberty due to a disturbance of the ductless glands? Was the atheroma of adults due to dietetic influences, possibly superimposed on changes produced as suggested at earlier ages? Special cases might be affected by special additional factors—e.g., the hypercholesterolæmia of diabetes. Particular caution was necessary in interpreting the results of feeding rabbits with cholesterol when attempting to explain pathological changes in the vessels of man. He favoured the view that atherosclerosis in man was a form of "cholesterol gout," a metabolic disease not necessarily due to any gross changes in the chemical composition

of the blood. Finally, Prof. Aschoff reminded his listeners of the great importance of mechanical factors —e.g., the blood pressure, the effect of stretch and stress, the influence of weak spots in the walls, of valves, and the strain at points of branching, &c.— in determining the localisation of atheroma.

Dr. R. SCHOENHEIMER pointed out that cholesterol deposition in the tissues of normal man by prolonged feeding with cholesterol was impossible, owing to the means available for its ready excretion. Such deposition might occur, however, if excretion of sterols was restricted. He presented most interesting experimental results of a comparison between the sterol contents of normal intestine and of isolated loops of gut. Cholesterol was excreted into the normal bowel; some of this was reabsorbed; some was converted into coprosterol and β-cholestanol, neither of which could be reabsorbed. In the isolated loop much β-cholestanol but little cholesterol was found. He had been able to extend his investigations to a case of xanthomatosis of the tendon sheaths in man. The initial hypercholesterolæmia (some 850 mg. per 100 c.cm.) was due mostly to the ester form; it was reduced to about 300 mg., with a normal free to ester ratio, by a purely vegetable diet (which contained only plant sterols, which were not absorbed). He was not able to say where the cholesterol of the blood had gone; it was certainly notexcreted. This patient had excreted very little sterol even on a full diet; it was probable that her hypercholesterolæmia was due to a diminished fæcal excretion; it was worth while examining other cases of hypercholesterolæmia for impaired excretion, and when that was found adopting treatment by a vegetable régime. He regarded these cases of cholesterol deposition as analogous to gout, in that the abnormal metabolism was due to a failure of excretion.

DISCUSSION

Dr. S. C. DYKE (Wolverhampton) discussed lipoid splenomegaly, which he regarded as due to a saturation of the reticulo-endothelial cells with lipoids. This might be due to a failure of excretion, or be congenital. He described the three main groups, Gaucher's disease, in which cerebrosides (kerasin or phrenasin), Niemann-Pick's disease, in which phosphatides (especially lecithin), and the Schüller-Christian syndrome, in which cholesterol was found in the deposits. He regarded all these as congenital in origin, and contrasted them with acquired lipoid splenomegaly, such as that due to the hypercholesterolæmia of diabetes or biliary obstruction.

Dr. J. W. MCNEE (London) dealt with some of the aspects of biliary disease, and pointed out in particular how greatly our knowledge of these diseases was held up by lack of a simple method for estimating bile-acids.

Dr. H. GAINSBOROUGH summarised the main causes of hypercholesterolæmia. Dr. J. M. H. CAMPBELL dealt with some clinical aspects of cholelithiasis and atherosclerosis, and Dr. J. D. ROBERTSON read a paper for Prof. E. C. DODDS, in which it was pointed out that in nephrosis the hypercholesterolæmia did not run strictly parallel with the degree of œdema. Further, it had been observed in cases of ascites, that though the plasma proteins fell after tapping the abdomen, the blood cholesterol did not rise.

Prof. ASCHOFF answered points which had been raised, and Dr. SCHOENHEIMER recounted a case of nephrosis in which marked atherosclerosis was found, thus negativing the general belief that intimal changes did not occur in this disease. Further points were discussed by Prof. M. J. STEWART, Dr. CECILIA SHISKIN, Dr. W. W. KAY, and Dr. DAM (Copenhagen)

REVIEWS AND NOTICES OF BOOKS

Quantitative Clinical Chemistry

Vol. II. *Methods*. By JOHN P. PETERS, M.D., M.A., Professor of Internal Medicine, Yale University School of Medicine; and DONALD D. VAN SLYKE, Ph.D., Sc.D., Member of the Rockefeller Institute for Medical Research. London: Baillière, Tindall and Cox. 1932. Pp. 957. 52*s*. 6*d*.

THE first volume of this work showed that one of the most ambitious attempts of recent years was likely to be successful. To summarise quantitative clinical chemistry in two volumes is an achievement indeed. Since one of the authors, Dr. Donald van Slyke, has succeeded during the past 20 odd years in making a quantitative series of biochemical methods out of what had hitherto only possessed the merest shadow of mathematical exactitude, no better collaborator on the biochemical side could have been chosen. Indeed the whole development of the manometric technique for the measurement of the concentration of the ordinary constituents of blood and urine has been achieved almost solely in the laboratories of the Rockefeller Institute.

The first chapter containing some 50 pages deals with the general methods employed in quantitative biochemical analyses. It might seem superfluous in a volume of this character to start with a description of balances, measuring flasks, and burettes; but so much information is compressed in a short space that there can be little doubt that it was worth while. One of the most interesting parts of this chapter deals with the importance of accurate calibration of volumetric apparatus. It is pointed out that the accuracy of graduation necessary for ordinary work is plus or minus 0·1 per cent., and moreover that liquids different in specific gravity and surface tension cannot be delivered with the same accuracy by a pipette graduated in terms of water. Whilst this fact is self-evident, its emphasis is of the utmost value. A very good description of micro-volumetric apparatus and a particularly useful account of the Rehburg burette and the use of this instrument in micro-titration is supplied. The preparation of standard solutions is also discussed and exact directions are given for the preparation of standard hydrochloric acid, while the principles of colorimetry and nephelometry are outlined.

The second chapter is concerned with special biochemical methods and deals with the collection of samples. The technique of arterial puncture, the collection of arterialised venous blood, and venous puncture are well described. A valuable part of this chapter deals with the anaerobic handling of blood; this is very complete and will enable the investigator to collect blood anaerobically and centrifuge it. The third chapter deals admirably with gas analysis, including the newer methods of analysis by the manometric van Slyke apparatus. There follows a series of chapters on respiratory metabolism, alveolar air, and blood volume. The remaining chapters concern the determination of the constituents of blood, urine, and fæces, and wherever possible a colorimetric, manometric, and volumetric method has been given. The methods described

have been selected with the greatest discrimination and criticism of the judgment of such authors would seem almost impertinent. We make a few plaintive suggestions in the hope that in future editions the authors will lighten our darkness on certain problems which they have not touched. For example, the determination of iodine in blood or other body fluids and tissues is not discussed—a subject of great importance which has attracted world-wide interest during the past few years. Nor is there any mention of enzymes. The determination of diastase and phosphatase are matters which occupy a good deal of the time of the biological chemist associated with clinical routine work. We should welcome the opinions of Dr. Peters and Dr. van Slyke on the relative values of a multiplicity of methods.

Any clinician or clinical biochemist who intends to publish a book or a paper should first consult this volume in order to see whether he can really advance the subject beyond the point to which the authors have already taken it. The volume will remain a permanent monument to the workers at the Rockefeller Institute.

Die konservative Behandlung entzündlicher Genitalerkrankungen der Frau

By Priv.-Doz. Dr. GUSTAV DÖDERLEIN. Leipzig: Georg Thieme. 1932. Pp. 117. M.6.50.

THIS small volume is one of an excellent series which is distinguished by the attention paid to treatment. The conservative treatment of inflammatory lesions of the female genitalia affords ample scope for the keen therapist, and extremely good results are often obtained. Practitioners should derive great help from a study of this book, for they will find most of the available methods adequately described. Particularly useful are the sections dealing with vulvitis, pruritus vulvæ, and gonorrhœa. The paragraphs in small print deserve careful study, for they indicate clearly the modern views on the pathology of the lesions. The younger Döderlein, who has written this book, is now Oberarzt under Prof. G. A. Wagner at the Charité, Berlin. He seems to have inherited the ability to record concisely the clinical experience of the German school.

Constitution-Types in Delinquency

By W. A. WILLEMSE, M.A., Dr.Phil., Lecturer in Psychology, University of Pretoria. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1932. Pp. 266. 15s.

THE work of Kretschmer has opened up a new field for work in psychiatry. Hitherto it might be said that apart from the established organic psychoses such as general paresis, alcoholic psychosis, post-encephalitic delinquency, and senile dementia, little has been done to correlate the reaction types with the physical peculiarities of the patients. True, Lombroso and his followers had marked off the alleged stigmata of degeneration, but constitution manifest in physique had never been closely studied before Kretschmer had suggested that pyknic, asthenic, and athletic physiques were correlated with manic-depression, schizophrenia, and epilepsy respectively. Many psychiatrists have found this correlation useful, and physiological undercurrents have been speculated upon to explain the emergence of these reaction types on the basis of endocrine polarities. But most maintain a receptive critical attitude without committing themselves to the dangers of water-tight compartments. Dr. Willemse has ventured to extend the Kretschmer classification to the study of criminal types. He does so with a wealth of clinical material but with an equal poverty of statistical verification. His descriptions of physical types are clear and suggestive, and his descriptions of the mental make-up of cycloid, schizoid, and epileptoid subjects is entertaining and instructive. But the descriptive clinical material based upon fairly ill-defined mental characters is difficult to correlate against equally descriptive types of physique. He does not, however, neglect intermediate forms nor the importance of dysplasia for delinquency, and his references are rich and well considered. The subject is still in the descriptive stage, but because of its novelty and suggestiveness, and for the bridge it builds between the physical and the mental, the book is welcome, and deserves to be studied for its own sake and to stimulate further research.

Human Pathology

Third edition. By HOWARD T. KARSNER, M.D., Professor of Pathology, Western Reserve University, Cleveland, Ohio. London: J. B. Lippincott Company. 1932. Pp. 1012. 45s.

IN its third edition this useful text-book has been carefully revised and new sections have been added on œdema, shock, rheumatic fever, and diseases of the teeth; the last is from the pen of Prof. Thomas J. Hill and forms a welcome addition to a pathological text-book. The sections on Bright's disease and endocarditis have been very largely rewritten in accordance with recent teaching. A useful feature is the list of references appended to each chapter; some older references have now been removed and 600 new ones have been added. We are glad to note that the author has resisted any temptation to enlarge the book; this edition contains only some 30 pages more than the last, and the volume as a whole is still one of the most compact, yet complete, text-books available.

British Journal of Children's Diseases

IN the July–September number (vol. xxix.) Dr. D. D. Payne records observations on 274 children who attended the Royal Waterloo Hospital Rheumatism Supervisory Centre between January, 1931, and March, 1932, giving statistics of familial incidence, social environment, relation to tonsillitis, chorea, and carditis, followed by an account of the methods of diagnosis and treatment carried out by his centre and details of a cardiac efficiency test.—In a paper on the Erythrocyte Sedimentation Rate in Juvenile Rheumatism, Dr. N. Gray Hill describes his method which is a modification of that of Fahraeus, with an account of eight illustrative cases. He holds that if the rate is below 10 : 20, active rheumatism other than chorea is not present and there is no real necessity for hospital treatment, whereas if the readings are above 10 : 20 the indications for rest in bed and more careful observation are increased.—Dr. Edward Podolsky, of Brooklyn, New York, contributes a paper on Calcium Therapy in Pædiatrics, and Dr. Norman D. Begg records a Ward Outbreak of Erythema Nodosum, which occurred in a ward containing 12 children, all under 6 years of age, convalescent from whooping-cough. In each case the Mantoux reaction was strongly positive, and X ray examination of the chest showed a slight increase in the root shadows, suggesting some degree of hilar gland infection.—Dr. Hazel H. Chodak Gregory describes Two Cases of Melæna Caused by Innocent Growths of the Small Intestine in girls aged 5 and 8 years respectively. In both cases the intestinal hæmorrhage gave rise to severe secondary anæmia. Recovery followed removal of the growths in each case.—Prof. Amir Chand, of Amritsar, reports a Case of Mongolism in India, which is apparently the first on record.—The abstracts from current literature are devoted to dermatology and syphilis.

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THE LANCET

LONDON: SATURDAY, SEPTEMBER 10, 1932

INFECTION WITH BRUCELLA ABORTUS

IT is now becoming fairly clear that man may become infected with *Brucella abortus* from two main sources—milk and direct contact with animals. Since, according to the most recent observations, 20–40 per cent. of the mixed milk-supplies in towns not practising pasteurisation contain living *abortus* bacilli, and since a high proportion of our herds of cattle are infected, the question is often asked why undulant fever is not more common in this country than it appears to be. Even admitting that only a fraction of the cases are correctly diagnosed, and that the number of reported cases affords but a poor index of the true incidence of the disease, there is still a serious discrepancy between the frequency with which human beings are exposed to infection and the frequency with which they develop clinical symptoms of infection. The answer seems to be that infection with *Br. abortus* resembles in many respects infection with the tubercle bacillus. We know that 6·4 per cent. of the mixed milks of this country contain living tubercle bacilli of the bovine type, and we know that only a small proportion of those consuming this milk develop clinical tuberculosis. The evidence of the tuberculin test, however, shows that latent infections, either with the bovine or the human type of bacillus, are extremely common. Most of these latent infections give rise to little or no trouble, and only a small proportion of them progress to the stage of becoming clinically manifest.

If the analogy with tuberculosis is correct, latent infections with *Br. abortus* should likewise be common, and this, in fact, appears to be so. The evidence obtained by examining Wassermann sera indicates that latent infection resulting from the ingestion of raw milk may often be encountered, especially in the first 20 years of life. With regard to infections by direct contact, the evidence is even more conclusive. A. THOMSEN,[1] in Denmark, found that veterinary surgeons working with infected cattle frequently had antibodies to *Br. abortus* in the absence of any history of undulant fever. Prof. J. H. DIBLE and Dr. MARGARET POWNALL[2] at Liverpool have now brought evidence to show that much the same holds true of men engaged in slaughtering animals and dressing meat. Of 100 slaughterers examined, 12 had an agglutination titre of 1/40 or over to *Br. abortus*, while of 100 control males of the same age-groups only 2 reacted at this titre. Particularly interesting was their observation that antibodies were absent from those men engaged in slaughtering pigs, but were present in those dealing with cattle and to a rather less extent with sheep. In view of the fact that contagious abortion has never been observed in pigs in this country, the negative results in pig-slaughterers lend additional weight to the thesis that antibodies in the blood to a titre of 1/20 or 1/40 are the result of actual infection with *Br. abortus*. The positive results in a number of slaughterers of sheep suggest that these animals may be infected with an organism of the brucella group, and they clearly demand further investigation.

While those in actual contact with animals may perhaps be infected through the skin, it is usually assumed that townspeople and milk-drinkers generally are infected through the alimentary tract. The theory is that when the bacilli are ingested in milk or cream, they are swallowed, pass through the stomach, and are apt to find their way through the wall of the intestine and so reach the mesenteric glands. Another route, however, is possible—namely, through the tonsil. In support of this C. M. CARPENTER and RUTH A. BOAK[3] at Rochester, New York, have recently adduced some interesting evidence. Fifty-six pairs of tonsils removed from children and adults for various causes were examined culturally and by guinea-pig inoculation, and in eight of them *Br. abortus* was demonstrated. Except for one patient who lived on a dairy farm and about whom exact information was unobtainable, all the positive cases had drunk raw milk known to contain *Br. abortus*, though only one patient was actually suffering from undulant fever at the time. CARPENTER and BOAK suggest that the organism may invade the tonsil and multiply or accumulate there until the resistance of the host is sufficiently lowered by fatigue or disease to permit of its invading the blood stream. How common primary invasion of the body via the tonsil may be it is impossible to say; it will be remembered that this route of entry has also been claimed for the typhoid bacillus, though the balance of evidence—especially that obtained from the experimental study of mouse typhoid—is against it. Before coming to any decision it would be necessary to make a comparative examination of the tonsils and mesenteric glands of raw-milk drinkers coming to autopsy. Some large hospital in a provincial town in which pasteurisation is exceptional might well make this a subject of inquiry.

[1] Jour. Infect. Dis., 1931, xlviii., 484.
[2] Jour. Hygiene, 1932, xxxii., 349.

MORAL AND MATERIAL PROGRESS

THE British Association for the Advancement of Science was born in York 101 years ago. Its objects were "to make the cultivators of science acquainted with each other, to stimulate one another to new exertions, to bring the objects of science more before the public eye, and to take measures for advancing its interests and accelerating its progress"—an admirable summary of the ideals which have, with so much benefit,

[3] Jour. Amer. Med. Assoc., July 23rd, p. 296.

led to the founding of the innumerable learned societies which have arisen during the century. We doubt whether medical men affect the meetings of the Association as much as they might. They have at any rate the advantage that doctors can there meet many interesting people with whom they would be unlikely to come into contact elsewhere and that there is no section of medicine or pathology or hygiene, nothing indeed of a more professional complexion than the section of physiology, and even this was omitted this year in view of the international gathering at Rome. The doctors therefore are free from obligations and can wander at will to papers and discussions on archæology or zoology or economics or what not for edification rather than instruction; they will also find well-organised facilities for entertaining excursions.

The present meeting at York—the fifth to be held in that splendid city—opened on August 31st with the presidential address by Sir ALFRED EWING, the veteran leader of scientific engineering, and though he made no direct reference to our immediate interests his words are worth some consideration by those who care to reflect on the broader aspects of medical practice. As might be expected, he celebrates particularly the sweeping pageant of discovery and invention which he has watched go by in his own experience and which has led man to a control of his material environment no one could have dreamed of when the President attended his first meeting of the Association 65 years ago. The miraculous has progressively become the commonplace, human life thereby has become richer, fuller, wider, healthier, and time and space have been so far abolished that the whole world is now in closer contact than Edinburgh was with Inverness 100 years ago. The pageant must needs have moved the wonder and admiration and delight of anyone who had eyes to see it. But Sir ALFRED goes on to two comments which really contain the pith of his address. Uncertainty, he says, is now replacing the cocksureness of the Victorian spokesmen of science who used to think that there was somewhere a finite explanation of the world to which the progress of knowledge would inevitably lead. This quest of truth has gone on ceaselessly and it has brought us now to doubt whether there is any truth to find more final than the steps which open up fresh questions. We discover new relations between observed phenomena, but the nature of what is found to be related continues to evade our comprehension. Relationships are apparently the only kind of discovery which we can make; we see more clearly where the procession is and it becomes more inclusive, but we do not now know where it is going to. The nature of things becomes more and more incomprehensible, and the procession becomes more and more absorbingly interesting by our very realisation that it can never reach a goal. And to a stimulating statement of this great truth Sir ALFRED adds some rather gloomy reflections. Admiration is, he says, now tempered with criticism, complacency gives way to doubt, doubt passes into alarm. Where are we going to? The engineer has showered over the earth an unimagined wealth of capacities and powers which has made for such happiness as material things may secure. But his gifts may be abused and the President goes so far as to say that ethically and morally man is not fit for the responsibilities which his material progress involves.

While it is true that man is never morally fit we venture to think that Sir ALFRED underestimates the ethical progress which has been made since the British Association was founded, and that if he had had more contact with biology he would not be so pessimistic about man's capacity to meet effectively any situation which may arise. He has been used to machines which need outside intervention if their hurts are to be healed, which work only under limited conditions and which have no power to adapt themselves to their surroundings. The tale which biology tells is far more cheerful; we see everywhere self-regulating adaptable organisms which evade and surmount their difficulties and fit themselves to what they find about them. The great lesson of the post-mortem room is not that man often fails to carry on his life, but that the body faces overwhelming troubles with a cheerful courage which keeps many an active spirit alive for years in a carcass which is irretrievably maimed. The biologist will have few qualms about man's suitability to play his part in a world which he has himself transformed. Sir DANIEL HALL has watched the same pageant as Sir ALFRED EWING but from the agriculturalist's standpoint: "righteousness," he says in a striking essay,[1] "is just as much a quality of the human mind as intelligence. Both are fitful in their operations, irregular in their distribution, and unequal in their intensity. I hold that both are growing in the human race from generation to generation, and this again I maintain to be a fact of observation, dependent on no assumptions of how or why." The fearful may well take fresh courage.

THORACOPLASTY IN PULMONARY TUBERCULOSIS

THE most important part in the treatment of chronic pulmonary tuberculosis is the treatment of cavities. There is always hope for the tuberculous lung which is free from these incubators which might have been designed by nature for the breeding of tubercle bacilli. The closure of a cavity means much more than the closing of an ugly gap in an essential organ; it implies a substantial reduction of the attacking forces. By the time that the lungs are the seat of chronic tuberculous disease the period of hæmatogenous infection has probably passed and we can aim at local victory with some hope of permanent cure. The types of cavity associated with early infiltration often heal spontaneously if the patient by taking to his bed relieves the lungs of the extra work necessary for active life. Cavities of a slightly

[1] Fortnightly Review, December, 1931.

more resistant type will often yield to pneumothorax treatment. Basal cavities may close as the result of a timely phrenic avulsion. Such closure of cavities results in amelioration of symptoms, reduction of expectoration, the disappearance of tubercle bacilli, and the healing of diseased tissues. These beneficent results, however, are only possible if the pleura is free from adhesions of the type which, either because of their situation or size, prevent adequate collapse of the lung and maintain the patency of cavities.

The division of adhesions which are preventing a satisfactory collapse of the lung may convert an inefficient into an efficient pneumothorax. Much progress has been made since JACOBAEUS devised his endoscope for the direct inspection of the pleural cavity and a cautery for severing adhesions. The employment of a high-frequency current to coagulate tissues before cutting with actual cautery or diathermic knife has lessened the danger of hæmorrhage and some at least of the difficulties formerly encountered in this very delicate operation have been obviated. But the division of adhesions is often impracticable either because of their situation, or because they contain pulmonary tissue, or because the lung itself is adherent to the chest wall. When internal pneumolysis is impossible, external pneumolysis is the only alternative to an expectant policy that in many cases might almost be termed a policy of despair. But it should never be forgotten that the results of thoracoplasty are irrevocable, that the operative risks are grave, and that it often fails in its object. A valuable review by BÉRARD and DELGOFFE [1] describes how certain of these risks may be avoided and emphasises the necessity of careful collaboration between physician and surgeon at all stages of treatment. It would be unfair to condemn any method of treatment because it is not always successful, or to judge of results from a limited number of cases; no doubt many lives have been prolonged and some lives have been saved by thoracoplasty; but the physician who recommends the operation shoulders a heavy responsibility. Those whose candour compels them to report operative failures have been termed "crêpe-hangers." At the risk of joining that lugubrious company we must confess that the extremely favourable returns published from time to time by thoracic surgeons are less impressive than the results of operative interference seen not as statistical percentages but as tragic realities in the post-mortem room.

Though artificial pneumothorax is the best method of treatment for the varieties of tuberculosis which demand active intervention, it leads to permanent cure in only a proportion of the patients treated. The risks attaching to it are however small, the patient suffers no pain and little inconvenience, and at any stage in the course of treatment the lung can be permitted to re-expand. Thoracoplasty produces a less effective collapse than a successful artificial pneumothorax; the mental distress caused by an operation that usually necessitates two and sometimes more visits to the operating theatre must be severe; the physical suffering after operation is often acute; and a successful result can never be guaranteed. A distinguished American physician who visited Europe last summer explained that the object of his coming was to find out "why his thoracoplasties died." He added that neither in Berlin nor in London was any satisfactory reply forthcoming. Improvements in the technique of partial thoracoplasty and apicolysis may enable us to dispense with the more radical methods and reduce operative risks, but it does not seem likely that surgery tried, found wanting, and abandoned in the treatment of tuberculosis of bones and joints should prove more successful in the thorax than it has in the limbs and spine. It is distressing when a patient succumbs in spite of our efforts, but it is much more distressing when a patient dies because of our efforts. When disaster occurs the physician cannot blame the surgeon. It is the operation rather than the operator that has failed—an operation usually undertaken on the advice of the physician. Desperate diseases may demand desperate remedies, and when nature fails to cure we must perforce employ art. But a natural cure is always to be preferred to an artificial one, nor should we forget that for every patient saved by our crude therapy nature cures a thousand by means too subtle for our heavy understanding. It is for this reason that statistics so often fail to convince. We know that the majority of patients survive the operation of thoracoplasty. What we need to know is how many lives are saved by thoracoplasty which would otherwise have been lost. It is noteworthy that the type of disease considered most suitable for this operation, the proliferative type occurring in the post-adolescent years, is the type which tends to pursue a chronic course without special treatment and is subject to prolonged remissions. Despite the admiration which the persistence, skill, and courage of the small band of thoracic surgeons rightly evoke, the physician will serve neither the cause of medicine nor the interests of his patients unless he views their work with a critical eye.

[1] Bérard, L., and Delgoffe, A.: Onze années de pratique de la thoracoplastie dans un service hospitalier urbain, Arch. Méd.-Chir. de l'App. Resp., 1932, vii., 1.

THE Secretary of State for Scotland has appointed Dr. James Law Brownlie to be chief medical officer of the Department of Health for Scotland in succession to the late Dr. John Parlane Kinloch. Dr. Brownlie, who graduated at Glasgow in 1913 and obtained the M.D. (with commendation) in 1918, is at present one of the medical officers of the department and has been engaged on the coördination of hospital services in Scotland. He has represented the department on various scientific bodies and committees, and throughout his period of service has worked in close association with the late Dr. Kinloch. His previous experience included posts as resident medical officer in the Glasgow corporation fever hospitals, as assistant bacteriologist in the Glasgow corporation laboratory, and as bacteriologist and pathologist to the county of Lanark.

ANNOTATIONS

HIGH MATERNAL MORTALITY

IN the final report of the Departmental Committee of the Ministry of Health on Maternal Mortality and Morbidity, reviewed recently in our columns,[1] attention was drawn to certain areas of England and Wales in which the risks of childbirth have for many years been appreciably above the average for the whole country. The details of the investigations from which this information was supplied have now been published as a separate report (No. 68 in the Ministry of Health's series on public health and medical subjects).[2] The areas studied were certain industrial towns in the West Riding of Yorkshire, the county of Lancashire, and ten counties of Wales. It had been observed for many years that an exceptionally high maternal death-rate prevailed in these areas, and reference has been made to it previously in various official reports. It was considered, however, that a somewhat more detailed investigation was desirable to ascertain whether fresh light could be thrown upon the causes of maternal mortality, whether the maternity and child welfare organisation was adequate, and, if so, why it had apparently failed to secure an improvement in the maternal mortality-rate. The inquiry was directed by Dame Janet Campbell, M.D., who herself studied conditions in the Yorkshire towns. Dr. Isabella Cameron and Dr. Dilys Jones were responsible for the inquiries made in Lancashire and in Wales respectively.

In Yorkshire's industrial towns it was noted that the high death-rate was due mainly to "other causes" rather than to puerperal sepsis. This naturally suggests an exceptional incidence of difficult or abnormal midwifery cases. The death-rates for both stillbirths and neonatal deaths were also above the average, which indicates that the excess of abnormal midwifery arises from those causes which may injure the child besides increasing the maternal risk—e.g., toxæmia, hæmorrhage, difficult labour due to disproportion or any cause likely to lead to premature birth. The report is unable to lead us any nearer to an explanation of this excess. It existed under pre-war conditions of comparative plenty. It is still present in times of wider unemployment and poverty. It cannot, it is concluded, be wholly accounted for by any outstanding characteristic common to all the areas, or by any local custom such as the employment of married women in the mills. Dame Janet Campbell suggests that much of the difficult midwifery is caused by disproportion between the size of the pelvis and the head of the fœtus, but it is not easy to see why this factor should have so distinctly local a distribution. In fact, the localisation of the high maternal death-rate to certain districts in Lancashire leads Dr. Cameron to reject the explanation that there is involved a question of race and consequent small pelvic development. She concludes, from her examination of the causes of maternal death in the county, that rickets is not a factor of the first importance. As in the Yorkshire towns, there is no conclusive evidence that the employment of women in factories, either before or after marriage, has a direct effect on the loss of maternal life at childbirth. Although it is true that the general experience is that the rate tends to be high in the cotton textile towns, Lancashire towns with the highest maternal mortality-rates are not exclusively those in which women are employed to a large extent in factories, while some towns with a relatively low rate have much industrial employment of women. Most of the local authorities, it is shown, have established well-considered schemes for maternal welfare, but many of these, Dr. Cameron believes, fail in their full effect because they are insufficiently utilised. In the Welsh counties considered by Dr. Dilys Jones, on the other hand, it is concluded, speaking generally, that the facilities provided for the care of maternity cases are far from adequate. Comparatively few authorities have established antenatal clinics or made other arrangements for the routine medical examination of expectant mothers. Even recognising the financial and geographical difficulties in rural areas, it is felt that more adequate provision could be made, though, here also, due advantage is not taken by the mothers of those maternity services which are provided. Another factor considered by Dr. Jones is the use of forceps. Statistics derived from the birth inquiry cards of health visitors or from the registers of midwives suggest that forceps are applied with unnecessary frequency. It is almost impossible to secure reliable information on the incidence of abortions, but the impression is stated that there is a considerable amount both in the rural and the industrial parts of Wales, and that the practice of procuring abortion is increasing, probably owing to economic conditions.

From this summary it is clear that no new or outstanding causes of maternal mortality have been discovered. But the report places in their proper perspective many factors which have been held to contribute to a high maternal death-rate. Success can only be obtained by simultaneous progress in several different directions. Among these, in Dame Janet Campbell's opinion, must be included (1) the creation of a better informed public opinion in matters relating to maternal welfare; (2) the maintenance of a healthy environment through infancy, childhood, and adolescence; and (3) the supply of the obstetric requirements of an adequate maternity service, including antenatal supervision, skilful midwifery, and postnatal care. The ultimate solution, the report concludes, will come only through the gradual establishment of a higher standard of ordinary clinical midwifery practice, while the better physical condition of the growing population should in time contribute materially to an improvement.

[1] THE LANCET, 1932, ii., 351, 360.
[2] H.M. Stationery Office. 1932. Pp. 96. 1s. 6d.

IRRIGATION AFTER PROSTATECTOMY

SEPSIS after prostatectomy is nowadays receiving much attention, and urologists are making greater efforts to reduce this serious factor in mortality. Dr. John Morton,[1] consulting surgeon to the Royal Prince Alfred Hospital, Sydney, points out that catheter drainage of the prostatic cavity is unsatisfactory because of blockage of the catheter. To prevent it a large-sized catheter must be employed, and this the urethra does not tolerate gladly. To overcome the difficulty, he recommends the use of a temporary drain through the perineum. A small midline incision is made in the perineum behind the bulb. Guided by two fingers of the left hand passed into the bladder from above, a closed clamp is pushed through the perineal incision into the prostatic pouch. The track is then dilated by opening the clamp, and a perforated drainage-tube is afterwards pulled

[1] Med. Jour. of Australia, June 4th.

through it and fixed so that one extremity lies in the prostatic cavity and the other outside the perineum. At the same time a fine irrigating tube is drawn up through the urethra and fixed to the bladder extremity of the perineal tube. By means of these tubes continuous irrigation can be carried out, the fluid entering through the urethral and leaving through the perineal tube. When the wash-outs are quite clear, both tubes are withdrawn.

Mr. Andrew Fullerton, of Belfast, has already described a method of perineal drainage for septic cases, but Morton's has the advantage of providing for continuous irrigation.

BLOOD CHANGES AFTER IRRADIATION

THE inquiry instituted on behalf of the X Ray and Radium Protection Committee into the blood changes recorded in workers in radiological departments of various hospitals should provide useful data if the response to the questionnaire issued is satisfactory. The evidence will be collected this month and reviewed in October. Since the incidence of fatal cases of aplastic anæmia first drew attention to the development of blood changes elaborate screening precautions have been devised for the protection of workers, and stringent conditions for the storage and handling of radium have been laid down. It has moreover been the practice to insist on a holiday for those handling radium when the lymphocytes have fallen below normal limits, even though the health of the worker may be apparently unaffected. Lymphopenia is the accepted criterion of unequivocal damage, but it is possible that as a result of this inquiry a reliable danger signal will be found at a much earlier stage—for example, in the eosinophilia which accompanies the preliminary rise of the cellular content of the blood where blood counts have been charted for each affected individual over a prolonged period. It is more probable, however, that the inquiry will show that blood changes are so rarely encountered that the periodical blood counts previously recommended will be necessary only for those who come in close and frequent contact with radium or X rays. The answers to the questions should elicit from each hospital the proportion of those cases (if any) in which alterations of the blood have occurred to the total number of workers examined; records of typical blood counts in affected cases with details of the worker's occupation; and duration of service as well as notes on treatment. It is however through charts of consecutive blood counts on the same affected individual that most useful information on prophylaxis is likely to be obtained; in radium workers at least these may be found to follow if unchecked a typical curve, though the period during which the changes manifest themselves may vary greatly. In X ray workers Dr. Ch. Aubertin[1] described twenty years ago two types of count in radiologists and radiographers who had been at work from ten to fifteen years: in one type the leucopenia was chiefly of polymorphs and in the other there was a relative excess of polymorphs with eosinophilia. The treatment has hitherto been removal from contact with radium or X rays for a time. In the absence of any established form of specific therapy for aplastic anæmia it is difficult to suggest any other or to hazard an opinion how often the sequence of blood changes and holidays can safely be permitted. Fortunately, even in hospitals where nurses are constantly in attendance upon patients under treatment with radium, the proportion of those affected is believed to be very small, and in general hospitals where a change of personnel occurs every three months the chance of damage to the hæmopoietic system is probably negligible. But this circumstance should not produce a complacent attitude with regard to the questionnaire, for the need of further definite information is apparent. Sir Humphry Rolleston, reviewing blood counts in X ray workers in a critical review of the harmful effects of irradiation (X rays and radium) published last year,[2] pointed out that the blood picture seen after exposure to irradiation for long periods may differ from that obtained experimentally by one or a few X ray exposures, and that this might be considered to correspond with Warthin's observation that the bone-marrow becomes affected later than lymphoid tissues. He drew attention also to the conflicting observations on blood changes, which the information now sought may help to resolve.

[1] Arch. d'électr.-médicale, 1912, xx., 150.

THE ABORTIVE TREATMENT OF GONORRHŒA

PRINCIPLES to guide those prepared to attempt the abortive treatment of early gonorrhœa are laid down by Dr. Hansteen in the *Norsk Magasin for Laegevidenskaben* for August, 1932. The treatment should not be attempted if the infection has existed for more than six days, or in the presence of signs of severe irritation, with swelling and tenderness about the orifice of the urethra. The criterion by which he judged the results of his treatment was the disappearance or persistence of gonococci after the first examination. Among the patients with a first attack of gonorrhœa, dating only two to four days back, there were 12 successes and 12 failures. Among the patients whose infection dated five to six days back, there were 13 successes and 8 failures. A second group of patients included those who had previously had gonorrhœa once or twice. In this group among those whose infection dated only two to four days' back, there were 68 successes and 19 failures; among the patients in the second group whose infection dated five to six days back, there were 35 successes and 27 failures. Taking all cases together, 194 courses of abortive treatment yielded 128 successes and 66 failures. This by no means negligible measure of success was achieved by a comparatively simple ritual: thorough preliminary irrigation with 1 in 4000 permanganate of potash, followed by 2 per cent. protargol for five to six minutes, and finally treatment of the first 3 or 4 cm. of the urethra with pure protargol powder. The patient was instructed to give himself three injections of a 1 per cent. solution of protargol on the next day. The results were checked 10 to 12 days later. Though micturition provoked some burning on the first day, the patients willingly submitted to this treatment in order to achieve a rapid recovery, and in no case did a stricture or other serious trouble supervene. In this connexion it is of interest to recall that when some months ago the candidates for the vacant chair of skin and venereal diseases in Copenhagen had to deliver addresses on subjects chosen by themselves, one of the candidates, Dr. Svend Lomholt, chose as his subject the injection treatment of gonorrhœal urethritis in men, and he raised the question whether injections are useful in the treatment of uncomplicated gonorrhœa in men. Although his clinical experiences led him to answer this question in the affirmative, he held that

[2] Quart. Jour. Med., 1930–31, xxiv., 101.

convincing statistical evidence of the effectiveness of treatment by injections is lacking. In the absence of controls Dr. Hansteen's figures might not be acceptable to statisticians, but it seems unlikely that a consistently negative bacterial report would be obtained in so short a period after untreated attacks of proved gonorrhœa.

CHOLESTEROL METABOLISM IN EPILEPSY

CHOLESTEROL, as Mr. J. A. Gardner, F.I.C., reminded the B.M.A. Section of Pathology (see report on p. 577), is an integral constituent of all animal cells and body fluids. Its chemical relationships have been intensively studied, but hitherto its variations in health and disease have perplexed rather than enlightened the pathologist. A difficulty in investigating its metabolism lies in the fact that when released by the breaking down of the cells which contain it cholesterol is not excreted but is used in the formation of new cells. Our knowledge of its relation to arterio-sclerosis is now becoming more precise and, although no allusion to it was made at this discussion, the study of blood cholesterol in epileptic subjects is giving interesting results, impetus to the study having been given by the observation that a very high fat diet may control fits. Working at the State Hospital at Dixon, Illinois, Gray and McGee,[1] found the mean cholesterol content of the blood taken four hours after food in 29 observations on normal people to be 194 mg. per cent., in 312 observations on epileptics it was 163, and in 108 on feeble-minded it was 154. A total of 623 observations on epileptics, including blood taken at all periods after food, gave a mean result of 165. Their estimations were made, for the most part, on whole blood. A rise of cholesterol occurred frequently but not uniformly within the first hour or two after meals, and they conclude that a variation up to 30 or even 40 mg. per 100 c.cm. must be regarded as within the normal range for any individual. When however, averages of a large number of individuals are compared a difference of 10 mg. or even less may become of significance. With regard to fits, Gray and McGee find there is a definite low point (162 mg.) an hour after fits, the cholesterol gradually rising thereafter to a maximum of 172 when there has been freedom from fits for a month, though this figure, be it noted, is still considerably below that for the normal controls. All this tends to confirm the observations of Robinson, Brain, and Kay,[2] and of Gosden, Fox, and Brain,[3] and establishes the fact that blood cholesterol tends to be low in epilepsy, particularly just after seizures. No mention is made of the more vital and interesting problem of the pre-fit blood cholesterol. It might well be supposed that such a phenomenon as an epileptic fit would have complex metabolic results of an order that could be estimated. The important question is whether there are changes in the blood or cerebro-spinal fluid which precede the seizure and take a share in its determination. This point can only be cleared up by series of observations made at short intervals on the same patient for some hours before a fit occurs, or, not quite so satisfactorily, by a very large collection of observations made on a number of patients at varying intervals before fits have occurred. This principle applies to all metabolic investigations in connexion with epilepsy, but unfortunately as fits cannot be predicted with any certainty, serial pre-fit estimations can only be obtained occasionally after an immense amount of labour. Gray and McGee report some serial post-fit figures for cholesterol, which bear out the general results referred to above. A few serial pre-fit estimations were reported in the two papers published in our own columns, and these tended to show that the fit occurred near the bottom of a rather rapid fall in cholesterol content. The still lower level of blood cholesterol found in feeble-minded persons by Gray and McGee is striking. They make no comment upon it beyond suggesting that high fat diets might be desirable in institutions for these patients. The epileptic patients upon whom their observations were made were all hospital inmates. Their mental status is not specified, and the lowered cholesterol in their case possibly had relation with some condition other than the epilepsy. Further investigation might show a relationship between blood cholesterol and mental ratio.

[1] Gray, H., and McGee, L. C.: Cholesterol Content of Blood in Epilepsy and in Feeble-mindedness, Arch. Neur. Psych., August, 1932, p. 357.
[2] THE LANCET, 1927, ii., 325.
[3] Ibid., 1929, ii., 12.

DURABLE PEDIGREE SCHEDULES

FOR the study of morbid inheritance in man trustworthy records are essential. A schedule[1] already noticed in these columns has provided a uniform and adequate guide for this purpose. But it is not only morbid inheritance that needs to be recorded; normal and positive qualities, personality, attainments, intelligence, habits, and other such data are of relevance to the student of human genetics. In order that family pedigrees may be kept which will embody such information, the Eugenics Society has produced a larger schedule,[2] which is designed to be filled in by intelligent persons desirous of transmitting to their descendants as full an account as possible of the members of the family in each generation. Such a record will be of the greatest value to any doctor called on in the future to give a genetic prognosis. The demand for a medical opinion on these points is steadily growing, but no system of recording pedigrees hitherto has provided the necessary data. The schedule is strongly made, with a buckram cover, and the paper is guaranteed to last for at least 100 years. All the parts are detachable, and specimen leaves and a reinforced vellum chart are provided, as well as full explanatory notes. Additional case-sheets, beyond the 30 included with the schedule, can be obtained as required. In making available so convenient and durable a pedigree schedule the Eugenics Society has rendered a service not only to genetics but also to preventive medicine.

STREPTOCOCCI

IT was in 1906 that Andrewes and Horder published their classical paper on the classification of the streptococci and gave a great impetus to the study of what have come to be the most important group of human pathogenic bacteria. Hygiene and serology have brought many microbes under at least partial control, but the streptococci have largely defeated the efforts of those who have sought to make out their modes of attack on the body or to treat established infections along specific bacteriological lines. Such studies must necessarily be based on the identification of the various kinds of streptococci which undoubtedly exist. Biochemical methods

[1] How to Prepare a Family Pedigree. Eugenics Society, Grosvenor-gardens, London, S.W. 6d.
[2] Pedigree Schedule. The Preparation of Family Records. Same publishers. 10s.

have proved inadequate, and various workers have attempted to supplement them with serological tests with partial but quite unsatisfying success. It seems clear that the hæmolytic organism generally known as *Streptococcus pyogenes* and responsible for the bulk of serious human infections is a "good species" in the natural history sense. But it is equally plain that the different strains of this species are no more identical than the diseases which they produce, and it has been the concern of many bacteriologists to separate and characterise them. It is on this quest that the late Sir Frederick Andrewes spent the last seven years of his working life, in coöperation with Miss Lettice Digby and with, later, Mrs. E. M. Christie; he died on Feb. 24th, 1932, leaving a characteristic account of his work almost complete, and this has now been finished by Mrs. Christie and his son, and published by the Medical Research Council.[1] It contains a wealth of technical detail about the methods and results of agglutination tests which will be of value to those working along similar lines. The main conclusions are, however, disappointing in that they lead to no clear-cut and definite criteria whereby the identity or diversity of different hæmolytic streptococci may be certified. Possibly agglutination is a method which is inapplicable in this particular group, and certainly both in their capacity to stimulate the production of agglutinating sera and in their reactions to the same the organisms seem to be perverse and froward to an inexplicable degree. It seems more likely, however, that the microbes are to an exceptional degree variable and adaptable, and that they are in a continual state of flux which may account for their varied capacities of invasion and pathogenic action. It may well be that as in some cœlenterates the different species and subspecies run into one another in a confusing way. Studied in the laboratory they certainly give this impression, and it is compatible with much of the epidemiological evidence, as Prof. C. C. Okell pointed out in his third Milroy lecture this year.[2] A solution will no doubt be reached some day, but for the present the relation of the gram-positive cocci to the body remains one of the most urgent and baffling problems of bacteriology.

CHOLECYSTOGRAPHY

On another page the uses and limitations of cholecystography in the diagnosis of gall-bladder disease are clearly defined by Dr. James F. Brailsford. His article is founded on a large number of carefully studied cases, and his conclusions will be accepted by most workers in this field. His plea for careful attention to technique and detail should not be ignored, for many errors in interpretation creep in from a neglect of minutiæ. This is particularly true among ambulatory cases, for the patient is not under direct control for a varying period between the administration of the dye and the radiological examination; unauthorised food, to specify but one pitfall, may readily upset the result of the oral test. Dr. Brailsford's statement that the demonstration of a gall-stone in a radiogram does not of necessity mean the discovery of the cause of the pain, and that complete gall-bladder radiology gives the best indication of the condition of the gall-bladder requires a little amplification. Cholecystography must take its place with other methods of investigation; it has not rendered obsolete other aids to diagnosis. The clinical examination and, above all, the history extracted from the patient (the word "extracted" is used advisedly) must not be lightly disregarded in favour of a so-called positive radiological finding. It must be remembered that a normal gall-bladder may give no shadow and that one containing stones can fill and empty normally. A short course of rest combined with digitalis may make all the difference between the filling and not filling of a normal gall-bladder in a patient with a congested liver. The best method of administration is still in dispute. Intravenous injection of the contrast medium is, on theoretical grounds, the most reliable method of administration, since, by this route, the amount of dye which reaches the circulation is under complete control. Most observers therefore regard it as giving the most accurate results. In practice, however, more and more radiologists are adopting the oral route as the usual method of administration; it does not necessitate a night in hospital, there is less chance of severe reaction, and it is easier to carry out. Hitzrot and Pendergrass have shown recently[3] that in selected cases the intravenous route can be used safely in an out-patient department, the patient being sent home for the night. They add, however, that intravenous injection of the dye must not be used in a casual or haphazard manner, a conclusion we strongly endorse. Efforts are being made by variations in the technique of oral administration to obtain a greater concentration of dye in the circulation while maintaining the reduced liability to reaction. P. B. Davidson and his co-workers[4] give an intravenous dose of dye "sufficient to visualise the gall-bladder" but small enough to eliminate reactions, and follow this two hours later with a half dose by the mouth "for fortification of the shadow." They report good results from this method, and say that it can be used with safety in ambulatory cases. Sandström[5] aims at a cumulative effect by the oral route, for he gives the dye on two successive nights before making his radiological examination. Anderson and Marxer[6] have reported eleven cases investigated in this way, giving the full oral dose the first night and, if the shadow is absent or faint, a three-quarter dose the following night. Their series is too small to be conclusive, but it is interesting to note that of the eleven cases that gave no shadow after the first dose nine showed a normal gall-bladder after the second. If no shadow is obtained a repeated test is always a wise precaution, unless there is strong supporting evidence, for many observers have reported what may be called a temporary failure to get a shadow from a normal gall-bladder, whichever method of administration is used. In every cholecystography the rate and mode of emptying of the gall-bladder should be observed. Valuable information is often obtained this way, particularly in connexion with the influence of food. The value of cholecystography being now definitely established, a more settled terminology is overdue. The process is called variously cholecystography, the Graham test, the Graham-Cole test, the Cole-Graham test, and the dye test. Even the terms positive and negative are used in different senses by different radiologists; here a real danger lies, for "positive" may mean that the examination gave a pathological result or

[1] The Hæmolytic Streptococci: their grouping by agglutination. By F. W. Andrewes and E. M. Christie. Special Report Series No. 169. H.M. Stationery Office. 1932. 1s. 3d.
[2] THE LANCET, 1932, i., 867.
[3] Hitzrot, Lewis H., and Pendergrass, Eugene P.: Amer. Jour. Med. Sci., May, 1932, p. 593.
[4] Davidson, Percy B., Biguria, F., and Rosenthal, J.: Amer. Jour. Surg., 1932, xv., 525.
[5] Sandström, Carl: Acta Radiologica, 1931, xii., 8.
[6] Anderson, John H., and Marxer, O. A.: Brit. Med. Jour., 1932, ii., 401.

that a normal shadow was present. Similarly, "negative" is used to indicate either that nothing abnormal was noticed or, on the contrary, that no shadow was seen. "Filled and emptied normally" and "did not fill" are not much longer to write, and admit of no possibility of mistake.

BLOOD GROUPS: THE BURDEN OF PROOF

In the discussion on blood groups in our last issue (p. 528) it was pointed out that there is a difficulty in compelling a defendant to submit to the test. Evidence of blood groups would be chiefly valuable in bastardy proceedings which, though taking place before magistrates, are not of a criminal nature. Where actual crime is charged, the English law is remarkably tender towards the accused. There is an old maxim that no one is obliged *prodere se ipsum*, to give himself away. Thus any statement made by the accused before trial must be safeguarded by an elaborate caution so as to ensure that the statement is entirely voluntary. At the trial itself the accused can go into the witness-box, give evidence, and be cross-examined. If he does not do so, the judge may, but the prosecuting counsel may not, comment upon the omission. As regards evidence of what the accused has said before trial, the Court of Criminal Appeal has held that his silence is not to be relied upon as corroboration of an uncorroborated story. In another recent case that court gave an equally important ruling. The accused had received the formal statutory caution when before the examining magistrates. He had been told that he need not say anything if he did not desire to do so, but that whatever he did say would be taken down and might be given in evidence upon his trial. He then replied, "I don't want to say anything except that I am innocent of the charge." When his case came on for trial, the presiding judge's summing-up contained some adverse comments on this refusal to speak. An innocent man, he suggested, would have said frankly where he was and what he was doing when the offence was committed; if, he added, an accused man hangs back and postpones what he has to say till the eleventh hour, it is often because he wants to deny the police the chance of investigating his story and proving it false. The Court of Criminal Appeal said the summing-up was unsatisfactory; it was wrong to suggest that an accused person (who by a statutory formula is warned that he need say nothing) stands silent at his peril. The conviction and sentence of six months' imprisonment were quashed. So tender is the criminal law towards the accused. It follows that, if in a criminal case there were any question of an accused man's blood being tested, the law would be slow to exercise any compulsion. Nor would prosecuting counsel be encouraged—nor indeed would the judge himself probably see fit—to comment on the refusal to submit to a test.

ANÆMIA AND HOOKWORMS

At this year's annual meeting of the American Society for Clinical Investigation, C. P. Rhoads and W. B. Castle reported that a study of over 150 cases of hypochromic anæmia, associated with hookworm infection, in Porto Rico showed that intramuscular injection of red blood corpuscles caused increased blood formation, and concluded that it was logical to assume that the blood loss caused by the worms was significant as constituting a loss of potential hæmopoietic factors, and so producing defective blood formation. Neither elimination of the worms nor enrichment of the diet by meat and milk reduced the anæmia within the short examination period of two or three weeks, but the daily administration of 6 g. of citrate of iron and ammonia was nearly always followed by reticulocytosis, rapid increase in hæmoglobin and red corpuscles, and clinical improvement, and that despite the persistence of heavy hookworm infection and of a deficient diet. Liver was less effective than iron. Since in these cases of hookworm anæmia deficient diets were the rule and gastric anacidity frequent, it is suggested, in spite of failure of enriched diet to cause improvement, that dietary deficiency and gastro-intestinal changes are of major ætiological significance. It is of interest then to recall the massive clinical experiment made by Bailey K. Ashford and his colleagues in the same island, after the devastating hurricane of 1899 had left thousands homeless and starving. He reported[1] how, when he attempted to feed up on nutritious army rations those whom he thought to be suffering from the anæmia of malnutrition, they went down with diarrhœa; when fed plentifully on their own bulky diet their anæmia was unimproved; but when, after he had made his historic discovery that they harboured hookworms, he treated them with thymol, the result was very different. "As soon," he wrote of the campaign which followed, "as some notorious old anæmic, who had spent his last cent to buy iron pills, would return to his bario cured, the whole bario would swarm about our ears." Nothing could be more definite in this massive experiment than the failure of diet and iron and the success of disinfestation by thymol in curing the anæmia. A like experiment is taking place in Syria at the present time, for H. A. Yenikomshian and D. A. Berberian[2] have reported striking betterment after removal of hookworms when egg counts and worm recoveries had shown that few hookworms were present, in one case eight only. Here the species was identified as *Ancylostoma duodenale*. That the hæmopoietic structures can be stimulated to raise the quality of blood while the cause of its poverty remains is unquestionable; that it is in the interest of a patient to throw on these structures this extra strain instead of removing the cause itself, few medical men are likely to admit.

Mr. James Rögnvald Learmonth, surgeon to the Mayo Clinic, Rochester, Minnesota, associate professor of neurologic surgery in the University of Minnesota, has been appointed regius professor of surgery in the University of Aberdeen, in succession to Prof. Sir John Marnoch.

[1] Uncinariasis (hookworm disease) in Porto Rico. Washington, 1911.
[2] Trans. Roy. Soc. Trop. Med. Hyg., 1932, xxv., 399.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL.—The annual address will be given by Mr. Herbert Tilley on Friday, Oct. 7th, at 4 P.M., on the Nasal Accessory Sinuses. Lectures will be held at 4 P.M., on Fridays, every week during the winter session, beginning on Sept. 9th, when Mr. M. Asherson will lecture on indications for operations on the mastoid. Subsequent lectures will be noted in our Medical Diary.

BRITISH HOSPITALS CONTRIBUTORY SCHEMES ASSOCIATION.—The annual conference will be held at Torquay from Sept. 22nd to 25th. It will be attended by Dr. René Sand, of Paris, president of the International Hospitals Association, who will discuss the methods by which hospitals are maintained in various parts of the world. Delegates will attend to represent contributory schemes from all parts of the country.

SPECIAL ARTICLES

THE PATHOGENESIS OF MENTAL DEFICIENCY

By A. G. Morison, M.D., D.P.H.
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The following observations are made after a study of 84 consecutive and personally investigated cases of mentally defective children. In every case inquiry was made in regard to insanity, attendance at special schools, nervous disorders, epilepsy, illegitimacy, and alcoholism in the families of both parents, and in the brothers and sisters of the children. The health of the mothers during the pregnancies and any accidents or upsets to their peace of mind were considered, as well as the full life-histories of the children themselves.

ENVIRONMENT AND HEREDITY

The children came from homes which were classified thus: (1) easy and comfortable, with good intelligence of the parents, in which the children had been well cared for since birth; (2) casual, the parents being of poorer intelligence, but not neglectful of the children; (3) more casual and thriftless homes, with parents of poor intelligence and evidently neglectful of their children.

Table I.—*Environment and Defect*

Group.	Comfortable.	Casual.	Neglectful.
Idiots	2	—	—
Imbeciles ..	19	2	—
Feeble-minded ..	23	31	7

Table I. shows that the lowest grades of all had had better surroundings from birth than the others. In 62 per cent. of the feeble-minded, the home surroundings were casual or neglectful, the corresponding figure for the imbeciles and idiots being only 8·7 per cent.

In the lower-grade group (notifiable to the local mental deficiency authority) the family histories were completely healthy in exactly 50 per cent. of the cases. Mental defectiveness appeared in nine cases, in five cases one of the parents being feeble-minded. In the 34 families of this group there were 113 living children, 37 (that is 32·7 per cent.) of whom were defective, and in 3 cases only did the children have a defective brother or sister.

In the higher-grade group (not so notifiable) the family histories were healthy in only 36 per cent. of the cases. Feeble-mindedness itself was present in 25 of the family histories, for both parents were feeble-minded in 2 cases and one parent in 13 cases, and mental defect was otherwise present in the family histories of 10 other children. These 50 children belonged to 49 mothers who had in all 188 living children, 63 (that is 33·5 per cent.) of whom were defective, and in 14 cases the children had defective brothers or sisters.

Regarding a family history of mental defectiveness, then, these points emerge: (*a*) in the lower grade 26 per cent., and in the higher grade 50 per cent., had such a heredity; (*b*) there were 8·9 per cent. siblings in the lower grade, but 28·6 per cent. in the higher grade.

FORM OF BIRTH

In the case of 75 children the birth was natural, instrumental aid being applied in 9 cases. Six low-grade children call for further comment. For, in every one the family history was untainted, the mother was of high intelligence, the pregnancy throughout was uneventful, but in 4 cases severe fits commenced within a few hours of birth, in the fifth case the head of the child "was out of shape for three weeks," and the sixth case was one of placenta prævia, terminated by instruments without anæsthetic because of the mother's excessive hæmorrhage. All the children were males; one was a cerebral diplegic, one a spastic paraplegic, one had a monoplegia (left arm), and four of these six children continued to have fits.

POSTNATAL ILLNESS

Of the lower-grade children three had had encephalitis, two suffered from fits (both commencing at about eight months of age), one had had cœliac disease, and one had had whooping-cough when three months old. (One night he coughed until blood ran from his ears, nose, and mouth.) He was a deaf mute. Five higher-grade children seemed to have had their development arrested in the following ways, three by fits (one so afflicted at six weeks, one till two years old, and one between two and three years), one was a case of dyspituitarism, and perhaps a fall out of his perambulator at the age of seven months had seriously affected another.

SOME OBSERVATIONS ON THE CHILDREN

The male sex predominated, more especially in the higher-grade cases (Table II.).

Table II.—*Sex-incidence*

Sex.	Lower-grade cases.	Higher-grade cases.	Total.
Male ..	20 (58·8 %)	32 (64 %)	52 (61·9 %)
Female	14 (41·2 %)	18 (36 %)	32 (38·1 %)

The children commenced to walk at times shown in Table III. As well as never reaching to normality,

Table III.—*Time of First Walking*

—	Under 18 months.	18 mths.–2 yrs.	2–3	3–4	4–5	Over 5	Still cannot walk.*	Age unascertainable.
Lower grade	12, or 35 %		3	10	2	3	4	—
Higher grade	21	10	12	1	—	—	—	6
	31, or 62 %							

*All aged over 7.

the defective seems generally to develop more slowly than the normal, such retardation being still more marked and of a greater significance, however, in the development of speech.[1]

CRANIAL CIRCUMFERENCE

Tredgold[2] gives a table of the normal cranial circumference for age and sex. 79·4 per cent. of the low-grade cases had a cranial circumference appreciably less than this normal, and in 20·6 per cent. this normal was exceeded; 64 per cent. of the higher-grade children failed to reach the average measurement, 22 per cent. were normal, and 14 per cent. exceeded normality.

[1] Morison, A. G.: THE LANCET, 1932, i., 931.
[2] Tredgold, A. F.: Mental Deficiency, London, 1929.

These findings are in agreement with the general observation that in physique also the mentally defective is subnormal. He often looks, as he is indeed, younger than his years.

ORGANIC NERVOUS SYSTEM

The organic nervous system was normal in 56 per cent. of the lower-grade and in 88 per cent. of the higher-grade children. In the first group, three suffered from cerebral diplegia (one with athetosis), three others from spastic paraplegia, two from hemiplegia, one from monoplegia (left arm), and there were two in whom the only abnormality elicited was a unilateral extensor plantar reflex. One case showed a mid-brain lesion, and another had ataxia of one arm. One girl showed a general amyotonia which was evidently improving (she was then aged 7 years, it may have been amyotonia congenita), and in another child there was only a poor balance generally. In the second group, one child showed ataxia of the right arm, one had not then (aged 5 years) gained full coördination of the muscles of the pharynx. In another, there was general muscular atonia, and in three others a poor balance.

Sixteen, or 47 per cent., of the first group showed strabismus; 11, or 22 per cent., of the second group were similarly affected. Amongst 7222 children examined in the ordinary schools, 1·39 per cent. showed strabismus.

OCCURRENCE OF FITS

Amongst the low-grade children, 19, or 55·9 per cent., had never had a fit, 12 remained subject to fits, the 3 others each having had one isolated fit. Amongst the higher-grade children, 84 per cent. of the group had never had a fit, and only one of the group remained subject to fits. Amongst 7222 children attending ordinary elementary schools, a history of fits was elicited in 0·16 per cent.

CONCLUSIONS

There are appreciable differences in the ætiology of mental deficiency in its lower and higher grades. For, in this review, prenatal causes (including heredity) accounted for 47 per cent. of the lower grade, but for 72 per cent. of the higher grade. Circumstances of delivery were connected with the defectiveness of 17 per cent. of the lower grade, while such circumstances could not be connected with the defectiveness of any of the higher grade. To postnatal illnesses were attributed 21 per cent. of the lower grade, but only 10 per cent. of the higher grade.

Sterilisation has but a very limited application in the prevention of mental deficiency in its lower grades. For the lower-grade children appear often where least to be expected, and their presence in a family is no proof of an inability of the parents to beget normal children. Amongst the higher grade, sterilisation would certainly prevent the births of a number of feeble-minded children. But it is to be noted that all defective children do not have a defective parent, and it is no more true that these parents have only mentally defective children.

The majority of the mentally defective are of the male sex.

As a class mentally defective children are also physically subnormal; and they are stigmatised, maimed, and scarred, the more so as is their defectiveness more pronounced. But there is no pathognomonic physical sign of mental deficiency.

MEDICINE AND THE LAW

The Lübeck Trial: Judge's Suicide

QUESTIONS of the mental fitness of a judge do not often occur. The judicial handling of a trial may be reviewed on the grounds of mistake as to the law, misunderstanding of the facts, wrong admission or exclusion of evidence, and even partiality or bias; but it is rare to find a result challenged on the ground that the judge was not in full possession of his senses. This seems to have happened in the Lübeck proceedings, where two doctors were sentenced to imprisonment in February last on charges of negligence, involving the death of some 70 infants who had been subjected to the Calmette vaccine process for tuberculosis immunisation. Dr. Wibel, the presiding judge, suffered a nervous breakdown after a long and complicated trial. He is now reported to have committed suicide; it is suggested that he had become aware of the fact that defending counsel had put forward as one of the grounds of appeal the allegation that he was not in a fit mental state at the trial.

If a similar situation arose in criminal proceedings in England, there would be no need to raise the question of the judge's mental capacity. The Court of Criminal Appeal would be in possession of a verbatim report of the judge's summing-up and of the evidence. These would furnish sufficient material for deciding the appeal without recourse to medical evidence of the judge's state of mind. If defending counsel thought that a defendant's chance of a fair trial had been prejudiced by judicial incapacity after this fashion, it would be their duty to say so fearlessly. An English court does not lightly tolerate any reflection upon the capacity of an English judge; "scandalising a judge" is a form of contempt of court; but what counsel say in court is privileged as regards actions of defamation. If a judge were known to be losing his grip of judicial work, the fact would hardly escape the knowledge of appellate tribunals, which would doubtless examine his decisions the more carefully. But there have been judges who, while apparently disposed to slumber on the bench, have usually known how to be wakeful at the right moment. In the last resort an incapable judge can be removed in England by a resolution of Parliament. This weapon is rarely needed.

PARIS

(FROM OUR OWN CORRESPONDENT)

VERDUNISATION OF THE WATER-SUPPLY

Mr. Justin Godart, Minister of Public Health, has recently inaugurated at the communal station of Ivry the new special installations for providing Paris with potable water. Parisians have for over six months been enjoying the benefits of their new water-supply, the purity of which they owe to Philippe Bunau-Varilla. He has played a remarkable part in the public health administration of his country. Attached to the army of Verdun, he devised the chlorine process of water sterilisation to which he has given the term "verdunisation," and has refused to take out any patent in connexion with the process. Bunau-Varilla has for many years been the fervent apostle of drinking water reform throughout France. In July, 1929, he presented a report[1] to the authorities

[1] See THE LANCET, 1929, i., 371.

concerned with the water-supply of Paris, challenging the dictum that Paris was already supplied with pure water which had no bad taste and brought no danger of enteric fever. His reply was a flat denial that Paris was protected against an epidemic of enteric fever. He pointed out that Paris had two water-supplies, one of which was non-potable and was intended only for industrial purposes. This water, the consumption of which was admittedly dangerous, was actually contaminating the drinking water-supply. In spite of the efforts of the municipal services, more than one source of contamination was discovered almost every month. Bunau-Varilla was therefore moved to press for the verdunisation of contaminated river water; and it is thanks in large measure to his consistent advocacy of this reform that Paris in 1932 has at last achieved a reasonably safe supply of drinking water. The history of the purification of the water-supply of other towns in France has recently been told in the *Siècle Médical*. Rheims, for example, had, before the war, an average enteric mortality of 12·4 per 100,000 inhabitants. By 1930 its enteric mortality had been reduced to zero, where it has remained ever since. Another town to anticipate Paris in the verdunisation of its water-supply is Lyon which, in 1926 and 1927, had an enteric mortality of 3·16 per 100,000. In 1928 the great epidemic raised this mortality to 9·3, and it was still as high as 8·43 in 1929—the year when verdunisation was introduced. By 1931 the enteric mortality of Lyon had been reduced to 0·88 per 100,000. The extraordinary difference between the enteric fever mortalities per 100,000 of Paris on the one hand and London and Berlin on the other are to be seen in the following table:—

	1927.	1928.	1929.
Paris	5·8	5·2	4·1
London	0·7	1·1	1·0
Berlin	0·6	0·5	0·9

THE PERMANENT WAVE INDICTED

In a recent communication to the Academy of Medicine, Dr. André Feil, of the Institute of Industrial Hygiene, criticised the processes by which straight hair acquires a permanent wave. This criticism is, by the way, not new; as early as 1930 the same subject was discussed at a meeting of the Spanish Health Society. Dr. Feil's account of the dangers run by the aspirants to wavy hair need hardly make it stand on end, for his indictment is limited. It is true that during one stage of the complicated process the client experiences a sensation of local heat which may be extremely disagreeable, particularly in hot weather. This sensation may, it is said, be followed by one of fatigue and heaviness of the head. In most cases these local and general symptoms last only a day or two; and if the matter ended there, the hairdresser's clients would assuredly consider their sufferings negligible. But Dr. Feil pushed his attack on the permanent wave home with the record of a case, the fatal issue of which he was inclined to trace to the waving operation. The patient was a girl of 13, apprenticed to a hairdresser who, having just bought a new apparatus, tested it on his apprentice. She had previously shown no premonitory signs of meningitis. It was a hot summer's day, and the electric current failed during the application, which was continued beyond the time limit indicated by the instructions. During the operation the girl sweated freely, complained of the heat and of headache, and begged to be set free from the apparatus. During the following days she suffered from attacks of giddiness and headache which were followed by vomiting. She remained at work for some days; then, obvious signs of meningitis supervening, she was admitted to hospital. Death occurred a month from the date of the permanent waving, after a period of delirium and coma. Dr. Feil suggests that death was due to tuberculous meningitis precipitated by the permanent waving, though no tubercle bacilli had been found in the cerebro-spinal fluid. Though he considers the operation of permanent waving safe enough when carried out under proper conditions on a healthy person by a skilled hairdresser, he deprecates the application of this process to subjects of pulmonary tuberculosis, on the grounds that tubercle bacilli might become localised in the meninges. His list of contra-indications includes epilepsy, advanced age, arterio-sclerosis, and high blood pressure, lest the high temperature should favour a cerebral hæmorrhage.

HOT-BOTTLE BURNS DURING GENERAL ANÆSTHESIA

A recent decision in the law courts concerns a patient who, having been operated on for appendicitis, was taken back to her room, where she was left in the care of a nurse. Obeying instructions, the nurse put a hot-water bottle so close to the legs of the still unconscious patient that severe burns ensued. An action having been brought against the surgeon and physician in charge, the court ordered two experts to present a report on the case. They put the blame on the nurse, holding the doctors in charge not responsible. The court having given judgment in accordance with this report, the patient appealed against its decision with the ultimate result that the doctors were held responsible, damages of 6000 francs being awarded against them.

IRELAND

(FROM OUR OWN CORRESPONDENT)

DISTRIBUTION OF SWEEPSTAKE FUNDS

SOME weeks ago the Minister for Justice of the Irish Free State gave instructions for the disbursement to the participating hospitals of one-third of the amount available from the Manchester November Handicap Sweepstake. He has now given instructions for the disbursement of 95 per cent. of the remaining two-thirds, the small balance outstanding to be retained by the trustees for the present. It is understood that the 5 per cent. is retained pending the settlement of an objection raised by one of the hospitals. The amount available for the voluntary hospitals from the sweepstake was about £493,000, but for the purposes of their calculations the committee worked on a basis of the round sum of £500,000, the proportions of which allotted to some of the principal hospitals are as follows:—

	£
Children's Hospital, Temple-street, Dublin ..	22,770
Coombe Lying-in Hospital, Dublin	17,820
Mater Misericordia Hospital, Dublin	29,155
Meath Hospital, Dublin	18,860
National Maternity Hospital, Dublin ..	26,355
Our Lady of Lourdes, Dunlaoghaire	12,065
House of Industry Hospitals, Dublin ..	34,050
Royal City of Dublin	16,110
St. Anne's Hospital, Northbrook-road, Dublin	24,775
Sir Patrick Dun's Hospital, Dublin	26,390
St. Mary's Hospital, Cappagh, Co. Dublin ..	16,885
St. Michael's Hospital, Dunlaoghaire ..	12,450
St. Vincent's Hospital, Dublin	25,155
Central Hospital, Galway	44,645

WHOLE-TIME MEDICAL OFFICERS

Dr. Thomas F. O'Higgins, the county medical officer of health for Meath, is also a member of the

Dáil. At a recent meeting of the County Meath Board of Health, the propriety of Dr. O'Higgins's political activities was questioned by the chairman of the Board and by some of the members. Dr. O'Higgins said that he was conscious of his responsibilities as a public officer, and that he fulfilled his duties as such. If it were proved that he were not carrying out his duties satisfactorily he would resign, but as long as he was carrying out his duties he would spend his spare time as he chose. In a letter to the press on the meaning of the term "whole-time medical officer," Dr. T. Hennessy, medical secretary of the Irish Medical Committee, states that "whole-time" meant simply that a county medical officer of health shall devote his professional services entirely to public health work, and not engage in private practice. Such a provision is intended to ensure the independence of the medical officer of health. "Before and after the working hours necessary to discharge their duties," Dr. Hennessy concludes, "county medical officers of health are free to take part in politics, farming, or even dog-racing if inclined that way."

IRISH MEDICAL MEN ON OLYMPIC COUNCIL

Among the members of the Irish Olympic team returning from the Olympic Games at Los Angeles, Dr. Patrick O'Callaghan, assistant medical officer at the Clonmel Mental Hospital, was welcomed at a public reception and dinner in Dublin on August 27th. He won the hammer event at the games, and was the only winner at Los Angeles who retained the championship won at the previous games at Amsterdam. His performance was some eight feet better than at Amsterdam.

Sir William Wheeler, who has been surgeon to Mercer's Hospital for 28 years, has left Dublin, and intends to practise in future in London. He has accepted appointment as one of the surgeons to the new Southend Hospital.

UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

CONTROL OF PELLAGRA

MANY in this country are still unwilling to regard pellagra simply as a deficiency disease, partly perhaps because the brilliant experimental work of Goldberger and his associates is so slow in bringing practical results. At a recent meeting of the American Medical Association in New Orleans, two surgeons of the U.S. Public Health Service pointed out[1] that of the 7146 deaths due to pellagra in 1930, 7000, or 97·9 per cent., occurred in those States which lie wholly or partially within the cotton belt, and most of the cases were found in that portion of the cotton belt actually engaged in the production of cotton. Whilst this very high mortality persists, and the morbidity is said to be actually increasing, the disease has already come under control in institutional life. The largest insane asylum in the south has reduced its pellagra mortality from 6·2 per cent. of all inmates to less than 0·1 per cent. Up to the present 35 foodstuffs have been tested by the public health service to determine their value as preventives of pellagra. Of these, milk, fresh beef, canned corned beef, liver, canned salmon, canned haddock, tomatoes, turnip greens, and canned English peas have each been found to prevent pellagra when added in sufficient quantity to an otherwise pellagra-producing diet. Dried yeast and commerical wheat germ are good sources of the P.-P. vitamin and are recommended for use in emergency. It is in late winter and early spring that the people in the cotton belt need supplementary foods. The Department of Agriculture backed by the agricultural colleges with their extension services, and generously aided by the newspapers, has long supported a programme of diversified farming. Progress has been very slow, and many believe the only hope of controlling this preventable disease to be in controlling the price of cotton.

[1] Wheeler, G. A., and Sebrell, W. H.: The Control of Pellagra, Jour. Amer. Med. Assoc., 1932, xcix., 95.

CONSUMPTION CURE FOUND FRAUDULENT

When the United States supreme court decided some years ago, in a divided opinion, that the words "false or misleading in any particular" in the Food and Drug Act referred only to the composition of the drug and not to therapeutic claims made therefor, a serious blow was struck at the efficacy of the Act in controlling the sale of secret remedies. To repair the damage wrought by this decision, Congress passed the Sherley amendment in its original form; this amendment declared a medicine misbranded when "false or misleading" claims were made. But the enemies of public safety were successful in getting this phrase changed to "false and fraudulent." It is now necessary, therefore, to prove to the jury not only that the claims made by the manufacturer are misleading to the public but that they were intended by him to mislead the public.

A remedy for consumption, rheumatism, lumbago, croup, and other diseases was originated by one W. P. McClellan, who owned a livery stable and used the remedy on his horses. This remedy, known as B. and M., is a simple liniment of, essentially, turpentine, ammonia, and egg. The federal government brought a case against B. and M. in 1922 and lost it. After 10 years, on July 19th, 1932, again at the instance of the federal government, this nostrum has been declared misbranded in the federal district court at Baltimore. During the trial the B. and M. concern called a number of witnesses who alleged that they had been benefited or cured by the use of the liniment. The government was able to prove, however, that those who had had active tuberculosis still had active tuberculosis. A testimonial widely used by the B. and M. concern had been written by a consumptive who at definite intervals received cheques from the concern, and who eventually had died of his disease.

The judge in his instructions to the jury expressed two opinions of considerable importance. The first, supported by a quotation from a supreme court pronouncement, is that persons who make or deal in products alleged to have curative powers are in a position to have, and are expected to have, superior knowledge of the preparation and marketing of such articles. The second is that the simple assertion by a manufacturer of his faith in the virtues of his product is not to be construed as proof of good faith when the manufacturer's opinion is contrary to an overwhelming mass of expert testimony.

POST-VACCINAL ENCEPHALITIS

Of the 700 cases of this disease on record, 71 have been recorded in the United States during the last

10 years. It has not been found possible to incriminate any particular method of vaccination or any particular batch or strain of vaccine virus; cases have followed the employment of calf virus from 10 out of a total of 18 vaccine establishments. Two out of the 71 cases are reported to have followed a second vaccination. All cases, except one, followed single insertion vaccinations, this being the technique commonly employed in this country. Dr. Charles Armstrong, of the U.S. Public Health Service, has brought forward a theory, based partly on previous observations and partly on his own experimental work, that a previous "non-specific" stimulation of the body's defence mechanism may tend to prevent post-vaccinal nervous complications. He has shown that if a preliminary injection of toxoid is given to white mice, who are subsequently given an intracerebral injection of vaccine virus, there are more survivals in the toxoid immunised groups, and also the toxoid treated mice tend to die later than the controls. It is suggested that a similar protection may be conferred in man by the following technique: the first dose of toxoid is given at six months of age and the second dose one month later. Vaccination against small-pox is given three to four weeks after the second inoculation with toxoid.

PANEL AND CONTRACT PRACTICE

Usual Occupation

"A man must be capable of doing his own work or else he was not capable of work." This statement, attributed by the *National Assurance Gazette* to Dr. H. G. Dain, chairman of the Insurance Acts Committee, is of course perfectly correct in assessing *in the first instance* any insured person's capacity or incapacity for work. This principle was recognised in Memo. 307/IC issued by the Ministry of Health, where it is stated that an insured person might be regarded as incapable of work by reason of specific disease or bodily or mental disablement when he is in such a condition that an attempt to work would be seriously prejudicial to his health; and *secondly*, that he should be regarded as totally unfit if, as will ordinarily be the case, it appears probable that he will soon be able to resume his former work, and that it would therefore be unreasonable to expect him to take any other form of work in the meantime. The last part of this clause, however, indicates that Dr. Dain's words were not intended to be a complete statement of the position. It has never been contended that because (say) a 'bus-driver loses a limb as a result of accident, and thereby becomes for ever incapable of driving a motor-bus, he should be written off as permanently incapable of work, and approved societies are frequently referring cases to regional medical officers for an opinion whether the insured person could not now be considered fit for some other gainful occupation. This opinion may be easy to give or it may be beset with difficulties. For instance, a farm labourer living in a small village contracts Bright's disease with some secondary bronchitis. The examining officer might easily come to the opinion that he was capable of doing something, such as clerical work, not involving exposure to cold or damp; but what chance would there be of this man being able to find this work in a small village, or that he would be mentally able to do it. Other cases which are always giving trouble about incapacity are epileptics and asthmatics; both are quite incapable of work during periods of attack, and in the great majority of cases both are fit to work within a relatively short time after the attack is over. Epileptics are only capable of work "not involving danger to themselves or others," and in both types the frequency of attacks is the crucial factor in deciding whether they are fit to work at all. In such cases it becomes simply a matter of who is to pay for their maintenance. If, as the *Gazette* says, the doctor certifies them incapable then the N.H.I. funds pay; if they are marked not incapable, being fit for something which has a restricting clause added "not involving so and so," they become chargeable to unemployment funds, if they are in an insurable occupation; and if not, being unable to obtain work, they eventually come under the care of the public assistance committee.

NOT UNFIT FOR HOME WORK

The difficulty of married women's incapacity, which was so prominently brought to the notice of the profession recently, has resulted in a departure from the usual form of certificate issued by the regional medical staff to doctors and to societies. It will be remembered that the claims of married women for sickness benefit had more than doubled, and societies were put to it to do something to cut down these excessive claims. Many married women were coming under the Act as a result of one or two days' occupation per week, only to be certified as incapable of charing, or some quasi part-time post, owing to some incapacity, either temporary like pregnancy, or possibly permanent like rheumatoid arthritis; frequently these people were thought by sick visitors to be quite capable of doing unaided the ordinary household work at home. Societies have now come to an understanding with the Ministry, under which they can obtain the opinion of its regional medical staff as to whether an insured person is capable of doing unaided her ordinary household duties. The form of words used in the reports, both to societies and doctors runs: "... is unfit at present to resume her former occupation but is not unfit for the ordinary daily work of her home," the words "incapable of work" on the usual form of report being erased. There has been no communication from the Ministry of Health to the profession generally, nor to panel committees, authorising insurance practitioners to alter Form Med. 40 (the ordinary certification form) in any way. On that form the doctor has to certify either incapacity or fitness to resume, and it is held to be a breach of the terms of service to alter it. The position appears to be that the regional medical staff may give opinions to approved societies on these cases whilst the practitioner in attendance is not permitted by law to do so.

A CITY DISPENSARY.—Under a scheme which has been sanctioned by the Charity Commissioners the Royal General Dispensary in Bartholomew-close, London, founded in 1770 by John Lettsom, is to be merged into St. Bartholomew's Hospital. The transferred property consists of the freeholds of 24, 25, and 26, Bartholomew-close, which is occupied partly by the charity and partly by a tenant who pays a rent of £450. The dispensary is to occupy part of the hospital building at a rent fixed by a valuer, and the medical and secretarial work will be done by the hospital in return for an annual payment. Should it no longer be possible usefully to carry on the dispensary section of the charity, its clear yearly income will be transferred to the hospital so long as the work of visiting out-patients at their homes is continued within the dispensary's area.

CORRESPONDENCE

CARBOHYDRATE CONTENT OF FOODS

To the Editor of THE LANCET

SIR,—Since our return from holiday we have been interested to notice the correspondence in your columns (pp. 372 and 420) about the carbohydrate food values published by us in 1929. We are glad to see that the analytical accuracy has not been challenged. We admitted frankly at the time of publication that our figures were far from perfect, but that we believed they represented the best approximations to the truth so far obtained, and this statement has remained uncontradicted for three or more years. Previous food tables were very largely based on the American analyses of 1899 in which the carbohydrate was determined "by difference." Our figures which tried to differentiate available from unavailable carbohydrate differed enough from the older ones to affect diabetic therapy, since the older figures for carbohydrate included in many instances large amounts of carbohydrate material which was not absorbed and metabolised as carbohydrate. Most American authors have completely ignored the newer figures and have continued to use the older ones, whereas the German, Scandanavian, and some British authors have advanced to the 1929 tables as indeed, we believe, ought generally to be done until we, in our turn, are shown to be wrong and our work out-worn.

We are, Sir, yours faithfully,

R. D. LAWRENCE,
R. A. MCCANCE.

The Diabetic Clinic, King's College Hospital, Sept. 3rd, 1932.

SPLENECTOMY FOR SPLENO-MEDULLARY LEUKÆMIA

To the Editor of THE LANCET

SIR,—In your issue of Sept. 3rd (p. 516) you report that Lord Dawson stated, at a recent discussion on the indications for removal of the spleen, that apart from trauma and rare tumours there are three diseases only in which splenectomy is justified—acholuric jaundice, purpura hæmorrhagica, and splenic anæmia. With the exception of McNee's statement, later in the discussion, that he includes the majority of leukæmias in his list of conditions in which splenectomy is contra-indicated, I find no reference to leukæmia. Lord Dawson's statement prompts me to send you a preliminary note of a married woman, aged 36, in whom splenectomy was this year deliberately performed for the relief of myeloid leukæmia. I understand that it is the first case of the kind in Westminster Hospital. The immediate result has been dramatically successful, but I propose to wait for a year before submitting a full account for publication.

The patient, who had been ill for a year, was admitted on May 10th. The spleen was enormous, the liver a little enlarged; but apart from the state of the blood she showed no evidence of disease. She was weak and breathless, due as much to the splenic bulk as to a moderate anæmia. The myelocytes were 76 per cent. of 150,000 white cells per c.mm. Between May 10th and 23rd, during which period she was confined to bed and given iron and arsenic by mouth, the white cells increased to 195,000; the myelocytes decreased however to 27 per cent. The spleen was then treated with radium, and liveroid was substituted for the iron and arsenic. On May 30th, after four applications of radium, the curve of the leucocyte count had fallen sharply. She had 46 per cent. myelocytes of 54,000 white cells. On June 18th, after a total of 11 applications of radium, and liveroid, the myelocytes were 16 per cent. of 60,000 white cells. This count was made immediately before operation. She felt neither better nor worse, and the spleen, although considerably reduced in size, was very large. Although the number of myelocytes had steadily decreased, the total number of leucocytes which had fallen so dramatically in conjunction with the first few applications of radium showed no further tendency to fall and remained about 60,000. It seemed that radium had done all it could for the time being. As I was unable to convince myself that splenectomy, certainly at this stage, had any claim to be harmful I accepted the alternative—namely, that it should be beneficial, although this view seemed opposed to general teaching. Accordingly, I asked Mr. Rock Carling to operate, and he did so on June 18th. Hæmorrhage was trivial and adhesions few. The spleen weighed 3½ lb. and showed a single yellow infarct, but not at the site of the adhesions. There was a sharp post-operative rise in the leucocyte curve to 75,000 (myelocytes 21 per cent.) within two minutes of ligaturing the pedicle and removing the spleen. After this rise the curve fell equally sharply, and on July 1st, two weeks later, the myelocytes were 8 per cent. of merely 8500 white cells. Further treatment specific to the disease is contemplated, but none of any kind has been given since the operation. On July 20th, the day of her discharge, the myelocytes were 4 per cent. of 8100 white cells, and on August 9th, on her return from convalescence, they were 2 per cent. of 7500 white cells. She said that she felt very well.

Osler (1910) wrote that splenectomy of the leukæmic spleen had been performed 43 times with 5 recoveries, but he did not state the type of leukæmia. In spite of this I have been brought up to accept the teaching that splenectomy in myeloid leukæmia is uniformly fatal from collapse or hæmorrhage. I quote this statement from Taylor's "Practice of Medicine" (1925). Surgery seems to be contra-indicated, not because of its failure to prevent relapse and ultimate death, and not because of the futility of treating a part only of the tissue which is diseased, but because operation is directly fatal. But from my experience of splenectomy in other conditions in which the spleen is diseased and enlarged, I have not understood the reason for supposing that collapse or hæmorrhage will occur specially in the surgery of myeloid leukæmia, and with such particular fatality. The cause of collapse, apart from the duration of the operation in a sick patient, may be supposed to depend in part on the too rapid expansion of compressed abdominal vessels. Hæmorrhage, severe enough to kill, may by inference be anticipated chiefly from vessels within adhesions. But surgeons deal with these matters successfully when they remove other abdominal masses.

I am, Sir, yours faithfully,

HILDRED CARLILL, M.D. Camb.,
Physician to Westminster Hospital.

Harley-street, W., Sept. 3rd, 1932.

THE INCREASE IN ARSENIC-RESISTANT SYPHILIS

To the Editor of THE LANCET

SIR,—While agreeing with Dr. Burke's main contentions I must demur from attempts to find a formula, with mathematical exactitude, as to the quantity of treatment required to cure syphilis. I am certain Dr. Burke will agree with me that it is not syphilis but syphilitics we are to treat, and that no two cases are similar. Bearing this in mind I would ask Dr. Sequeira what "authority" would have the courage to state with exactitude what constitutes adequate treatment. I know of no disease where a therapeutist would state with accuracy the quantity of drug required to cure that disease, yet one attempts to do so in syphilis where the

ravages are so protean. Can Dr. Burke tell your readers with certainty the life-history of the spirochæte; can he even tell at what stage of this life-cycle (if there is one) the primary sore develops; can he tell us whether all are infected with a similar strain or even how long the disease remains focal? This being so, is it not preferable to have a working basis of treatment, and to treat individuals as necessity demands?

I am, Sir, yours faithfully,

London, W., Sept. 5th, 1932. M. W. BROWDY.

"QUINSY-VOICE WITHOUT QUINSY"

To the Editor of THE LANCET

SIR,—In a letter published in THE LANCET July 16th (p. 158) Sir James Dundas-Grant asks if others have noticed the "quinsy-voice" in cases of œdema of the pharynx or larynx without quinsy. On two occasions recently I have examined patients with this symptom. Each time before inspecting the mouth I had remarked to my clerk that here is a case of quinsy and I was astonished to discover that in each case the view from the mouth was normal. On laryngoscopy, the first case showed œdema of the epiglottis, the second case swelling of the back of the tongue. Both recovered in a few days with inhalations, adrenaline injections, salicylates, and fomentations to the neck. I have never met the symptom before.

I am, Sir, yours faithfully,

A. BRAMWELL COOK, F.R.C.S. Edin., M.R.C.P. Lond.,
Medical Officer in Charge, Emery Hospital,
August 17th, 1932. Anand, India.

INTERMITTENT HEADACHE IN WOMEN

To the Editor of THE LANCET

SIR,—After reading Dr. A. P. Thomson's paper in your issue of July 30th I came to the conclusion that I had been entertaining angels unawares, in that a case in my care showed the syndrome described by Dr. Thomson.

The patient, an intellectual and critical woman of 33, first described her symptoms to me in June of this year, when I happened to see her during an attack. The headaches develop regularly on the day before her period, the periods being scanty but regular, with a 28-day cycle. On the day before the menstrual flow begins she wakes with the impression that her sight is obfuscated, and that acuteness of vision is reduced by about half; there are no fortification images. She creeps about until midday, by which time the headache is in full swing and she is obliged to retire to bed. Light becomes unbearable to her, and the pain is intense; at first diffuse, it later settles down in the region of the left temple, just above the zygoma. Nausea often accompanies the pain, but she never vomits during the attacks now, though previously she did so. She lies, she says, "dead still, waiting for the evening," her experience being that the pain goes with the daylight.

There is a perfectly definite moment at which the pain begins to abate, associated with what she describes as "a small physical movement inside the head." She tried to illustrate this sensation to me by holding two matchsticks vertically between finger and thumb, and clicking one past the other. From the instant at which she experiences this movement the pain begins to ebb, and by the end of two hours it has disappeared entirely. By this time it is usually 10 or 11 o'clock at night; she feels at once relieved, exhausted, and very hungry. During the attack she passes frequent formed motions and large quantities of pale urine.

She cannot recall having these headaches before the age of 18, though she remembers several outstanding attacks of the kind at or about that age. Since her marriage at the age of 24 the headaches have been more regular in their appearance, but she says that they only began to occur with "devastating regularity" after the birth of her first child in 1928. During her two pregnancies she had no headaches, was never sick, and felt extremely well.

She occasionally gets similar but less severe headaches during the intermenstrual period if subjected to undue strain and after travelling by train or boat, or in any vehicle with much vibration.

Up to the time when she first gave me this history she had tried the usual analgesics, such as aspirin and phenacetin, and had found that, though they might delay the onset of the headache, they never checked its course or prevented its development. Luminal was no more effective. She herself was convinced that the condition had its roots somewhere in the reproductive system, and was not to be approached by drugs acting on the central nervous system only. In 1928 she had her eyes examined by an ophthalmologist, who found in them nothing to account for the headaches. Her teeth and throat are in good condition, and her blood pressure 100/70.

Influenced by the fact that the headaches disappeared during pregnancy, I suggested that she might try taking extract of placenta by mouth, and ordered grs. 2 of Armour's dried preparation of placenta daily. She took the tablets in rather a desultory fashion for a few days before her July period. Neither of us, however, felt particularly confident that they would have any effect, and it cannot be said that the treatment received a thorough trial; at all events, the headache appeared promptly on the appointed day, and the patient refused to swallow any more placenta. The appearance of Dr. Thomson's article, however, and of the statement in your issue of August 20th that treatment of this condition with emmenin was being tried in Canada, gave me grounds for urging her to continue the treatment. Encouraged by the discovery that she had an authentic and recognised disease she embraced the remedy with fresh enthusiasm, and I took the opportunity to double the dose. The result, on the occasion of her August period, was remarkably successful; the onset of menstruation was delayed for a day or two, but the headache failed to develop, and she felt unusually well. How far a psychological basis explains this relief it is difficult to say, but further treatment along the same lines will doubtless determine. She is now prepared to take grs. 4 of the dried preparation daily throughout the intermenstrual period, and I should be glad to know whether there are any objections to this dosage.

In view of the X ray findings in 17 out of Dr. Thomson's 25 cases, a stereoscopic radiogram was taken of the region of the sella turcica, but no evidence was found of ossification of the interclinoid ligaments. It would be interesting to know, in terms of Dr. Thomson's theory of the cause of the pain, what is responsible for the sensation of movement inside the head felt by the patient just before the pain begins to abate. It scarcely seems possible that the pituitary, having remained for some time swollen and compressed against an abnormally complete dural roof to the sella turcica, begins to subside with such abruptness that the patient can distinguish the very moment at which, so to speak, the ebb sets in.—I am, Sir, yours faithfully,

MARGARET N. JACKSON.

Castelnau Gardens, S.W., Sept. 1st, 1932

"SAPRÆMIC" GLYCOSURIA

To the Editor of THE LANCET

SIR,—Temporary glycosuria is not uncommon; temporary hyperglycæmic glycosuria is much less common. One of the causes is a depression in the power of storing sugar due to an infection; this has been termed "sapræmic" glycosuria. A typical case is one in which the patient has multiple boils; sugar is found in the urine, but after the boils have healed the sugar disappears from the urine and the

patient appears to possess the average capacity to utilise carbohydrate. I have had little opportunity of investigating such cases five or more years after the attack, but frequently patients who are suffering from diabetes mellitus tell me that they had "a touch of sugar some years ago." The object of this letter is twofold: to learn the result of investigation of these cases of temporary glycosuria, and also to ask practitioners who have happened to see these cases to send them to a hospital for the necessary investigation, and then to publish their cases to permit us to learn whether there is such a condition as "sapræmic" glycosuria, or whether it is not really a temporary exacerbation in early mild diabetes induced by the toxins of the infection.

I am, Sir, yours faithfully,

London, W., Sept. 3rd, 1932. O. LEYTON.

THE ÆTIOLOGY OF GOITRE

To the Editor of THE LANCET

SIR,—An annotation in your issue of August 20th (p. 408) gives me the opportunity for a few remarks on the goitre-producing qualities of the cabbage diet of the Carpathian highlanders in Ruthenia, a part of the Czechoslovak Republic, where on the basis of Colonel R. McCarrison's experiments I studied the occurrence of goitre. Goitre occurs endemically in parts of these highlands, in some of the bad centres there are cretins and cases of myxœdema; cretins were found not only amongst the Ruthenians but also amongst the Jews living in the same villages. The worst goitre centres are found in villages where during the colder months of the year more than two-thirds of the population live to a great extent on cabbage, with addition of potatoes, maize bread, and oats, and the villagers, apart from those engaged in lumber work, live an unhealthy life in dark unventilated huts. The quantities of cabbage consumed are not small, a family of five members consuming daily about 2½ kilos; the very poor families may have cabbage nearly daily—three to four times weekly is the rule. Cabbage is used as a store food, pickled for from two to three weeks. Generally the pickling begins about the middle of October, with some early cabbage at the end of September; a family of eight members may pickle about 500 kilos. This pickled cabbage, stored in barrels, is a very important part of the diet during the months October to December.

The ætiology of goitre is manifold, and we do not seek in the cabbage diet the one and only reason for goitre in the Ruthenian highlands, yet our observations, made quite independently of Colonel McCarrison, bear striking resemblance to his. The following Table gives a few figures:—

Occurrence of Goitre amongst Children of all Ages from 6 to 14 Years from all Villages

—	Cases	Without goitre and percentage.	Slight enlargement and percentage.	Medium enlargement and percentage.	Excessive enlargement and percentage.
Boys	294	71 (24·1)	149 (50·7)	56 (19·0)	18 (6·2)
Girls	245	65 (*26·5*)	113 (46·1)	44 (18·0)	23 (*9·4*)

Occurrence of Goitre amongst Children from Three Villages with Excessive Cabbage Diet

Boys	161	16 (10·0)	87 (54·0)	44 (27·3)	14 (8·7)
Girls	114	9 (*7·9*)	64 (56·1)	23 (20·2)	18 (*15·8*)

The italicised figures show the marked differences.

In this table the well-known sex difference in the occurrence of goitre is distinctly marked; the percentage of cases without goitre out of the whole group of villages is much higher than the percentage from the three villages with excessive cabbage diet, while the percentage of cases with excessive goitre amongst the girls of the selected group is nearly twice as high as the percentage of the whole group. Following McCarrison, we put forward the view that the high incidence of goitre amongst the Carpathian highlanders is due to excessive cabbage diet during the winter months.

I am, Sir, yours faithfully,

Prof. V. SUK, M.D., Ph.D.

Brno, Masaryk University, Anthropological Institute, Czechoslovakia, August 27th, 1932.

THE SERVICES

Attendance on Officers' Families

COMPLAINT has recently been made that wives and families of military officers are left, by the new edition of the R.A.M.C. Regulations, just as they were before—only entitled to medical attendance by officers of that corps provided their lodgings are within a mile of the military hospital or the centre of the military station; and it has been proposed that the War Office should remove this limitation, as officers' families are now less able than formerly to pay the fees of practitioners in whose neighbourhood they may be settled. We were not told, of course, how many additional R.A.M.C. officers would then be required, nor how they are to be obtained, the strength of the corps being already 18 per cent. below establishment, for more medical officers would certainly be required, at least in the larger stations. The very considerable total of work done by the executive ranks of the corps is only made possible by collecting the patients for them in medical inspection rooms, so that time is not wasted in mere travelling, with clerks and orderlies to give help, and a hospital in the background to take charge of serious cases. The care of officers' families, in their widely scattered quarters, is a serious consideration to medical officers without the time-saving car that facilitates civil family practice.

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdr. W. H. A. Sinclair-Loutit is placed on the Retd. List.

Surg. Lt.-Comdr. P. J. A. (The) O'Rourke to *Harebell.*

Surg. Lts. E. R. P. Williams to Portland Hospital; F. W. Besley to *Dorsetshire;* W. D. M. Sim to *Courageous;* R. J. Corbett to *Tamar,* and for duties in dockyard; W. M. Greer transferred to permanent list; J. J. Cusack to *Vernon;* F. G. V. Scovell to *Royal Sovereign;* and L. G. Yendoll to *Victory,* and to *Hawkins* (on commng.).

ROYAL NAVAL VOLUNTEER RESERVE

Payr. Lt. C. G. Batty-Smith, M.A., M.R.C.S., transferred to Medical Branch as Surg. Lt.

Proby. Surg. Sub-Lt. G. F. Jones to *Victory,* for Haslar Hospital.

ROYAL ARMY MEDICAL CORPS

Lt.-Col. S. E. Lewis retires on retd. pay.

Maj. H. H. Blake to be Lt.-Col.

Maj. J. La F. Lauder, half-pay list, retires, receiving a gratuity.

Lt. (on prob.) R. V. Wright is secd. under the provisions of Art. 213, Royal Warrant for Pay and Promotion, 1931.

Lt. (on prob.) J. V. Quinn resigns his commn.

MILITIA

Maj. C. M. Page retires on attaining the age limit and is granted the rank of Lt.-Col.

TERRITORIAL ARMY

Lt.-Col. J. V. Bates to be Bt. Col.

RESERVE OF OFFICERS. REGIMENTAL LIST

Lt.-Col. and Bt. Col. J. V. Bates, from Active List, to be Lt.-Col. and Bt. Col.

ROYAL AIR FORCE

RESERVE OF AIR FORCE OFFICERS

G. Dunderdale is granted a commission in Class DD as a Flight Lieutenant.

INDIAN MEDICAL SERVICE

Majs. to be Lt.-Cols.: R. Sweet, J. R. D. Webb, F. Phelan, A. C. Macrae, and N. C. Kapur.

Lt. (on prob.) to be Capt. (on prob.): H. D. R. Zschperel.

The undermentioned Capts. (prov.) are confirmed in rank: J. H. Boultbee, P. L. O'Neill, H. S. Smithwick, and H. J. Curran.

The probationary appts. of the undermentioned are confirmed: To be Capts.: Gopal Das Malhoutra, Bantwal Panduranga Baliga, and Raghubansa Kishore Tandon, from I.M.S. (T.C.).

The undermentioned appts. are made: To be Capt. (on prob.): G. R. M. Apsey. To be Lts. (on prob.): W. H. G. Reed, T. E. Palmer, W. J. Poole, and C. J. H. Brink.

PUBLIC HEALTH SERVICES

London School-children

STUDY of the report for 1931 of Sir Frederick Menzies, as school medical officer for the county of London, indicates that the percentage of children referred for treatment (excluding dental caries) has fallen from 38 in 1911 to 18·5 in 1931; that the percentage of children referred for treatment of defects who were found satisfactory on reinspection has risen during the same period from 42·5 to 81·6; that the percentage found unclean at routine medical examinations has fallen from 9·8 to 0·5. The heaviest burden the school medical service has to bear is stated to be the poor condition of the children's teeth. At two of the residential homes transferred to the council's jurisdiction from former poor-law authorities, arrangements have been made for supervision of the children's teeth by dental surgeons; in all the other transferred homes some system of dental inspection was in existence. The dietary at residential institutions has also undergone reform. The council have drawn up a new diet sheet, presented in the form of a table of foods for each separate meal of the day, the choice of menu on any one day being left to the school authorities; this makes considerable variety possible, and authorities are particularly advised to avoid serving one specially dull item on the same day each week. A daily fruit ration is included in the diet. "In view of the fact," the report states, "that apples are our best medicofuge and have the property of leaving the mouth in a clean and wholesome state, the fruit ration is prescribed in the form of a definite amount of apple to be taken every day as the last item of food." Provision for open-air education includes nine day schools for non-tuberculous children, with accommodation for 1648 pupils, and six day schools for tuberculous children, with accommodation for 515 pupils; there are also five convalescent camp schools accommodating 484 children at a time for short periods, and 200 open-air classes in playgrounds and parks. During the year the experiment was made of taking children normally attending day schools for the mentally defective to a residential camp school. In June 25 boys went to the school, and in September 25 girls. The results were highly successful, the children appearing to benefit both physically and mentally. Dr. E. J. Boome, who reported on the scheme, thought that the advantage of it lay partly in the fact that it was confined to mentally subnormal children; probably if they had been sent to ordinary residential schools the results would not have been so good, owing to their sense of inferiority when with comrades of normal intelligence. In advising open-air classes for children selected on medical grounds a distinction is drawn between the bronchitic and the rheumatic type of child. Experience has shown that the bronchitic child thrives on open-air treatment of the sanatorium type, and the more exposure he gets the better he is, while the rheumatic child cannot stand such treatment and needs warmth and coddling. The report deals also with the inspection in higher education institutions, following up institutional care of children under 3 years of age, chronic invalidity, employment of school-children, stammering, the council's rheumatism and personal hygienic schemes, school journeys, nursery schools, child guidance, blind and deaf children, defective children, and infectious disease in schools. In all these departments the work of the school medical service is of public utility, and the money spent upon it in the nature of an insurance premium or sinking fund on a redeemable debt. We learn that during the latter part of the year any economies which could be made without impairing efficiency were effected. The service itself makes for economy in the long run.

Out-patient Clinics at Mental Hospitals

The Kent county mental hospital at Barming Heath was one of those which had established an out-patient clinic before the Mental Treatment Act gave statutory encouragement. This clinic, in common with most of its fellows, has been much appreciated by local practitioners, by relatives, and by patients. During the year 1931 treatment was sought by 37 new cases, many of them coming from a considerable distance, and most of them suffering from obvious mental disorder. Certification was advised for 11, 4 were admitted as voluntary patients, and 2 were referred to the mental deficiency authority. Of the 37, 15 were considered to have recovered before the end of the year. One of the integral factors in these out-patients' clinics is the social worker, who can visit the patients' homes, interview relatives and friends, and obtain a much-needed history to lay before the doctor, as well as interesting herself in the many personal problems of occupation and home that are not strictly medical and have yet such a wide influence on the mental state of the patient. At present the clinic at Maidstone is without this help, but the need is becoming more and more apparent. A similar clinic has been started in connexion with the Chartham Downs mental hospital at the Kent and Canterbury mental hospital, and is proving increasingly useful. The City of Leicester mental hospital also holds a successful weekly out-patient clinic where 112 attendances were recorded during 1931. Of these, 31 were recommended by local practitioners and 15 were admitted as voluntary patients to the mental hospital. This aspect of the work emphasised the need for a reception block; if out-patients are to be encouraged to enter the hospital when their condition requires it, they must be provided with some more attractive accommodation than a mixed ward. Other uses for the out-patient clinic are exemplified by the two patients who reported there while on trial-

leave from the hospital, and two more who attended for antisyphilitic treatment after their discharge. Leicester is happy in having the services of a mental welfare worker.

Confidential Investigations of Maternal Deaths

In a memorandum (164/MCW) to maternal and child welfare authorities the Ministry of Health commends the proposal that the local inquiries into maternal deaths made by the Departmental Committee on Maternal Mortality and Morbidity should not be allowed to lapse, but should be continued on similar though less detailed lines. Discussions of fatal cases between medical officers of health and practitioners are held to have enabled the former to estimate the adequacy and elasticity of the local organisation for maternal welfare, and the inquiries are believed to have also a direct educational value. A new and simpler report form has been drafted, with space for an account of antenatal care and for a brief description of the labour and puerperium, and comments are invited on any subjects which have a bearing on the case. It is desired that deaths following abortion and deaths primarily due to intercurrent disease should be included among those investigated. As the inquiry is solely for scientific and public health purposes, the information obtained is to be regarded as strictly confidential.

Disposal of Condemned Food at a Port

At the port of Manchester the vigilance of the medical officer of health kept off the market over 125 tons of imported food which were found defective and condemned. The history of a large consignment of tinned fruit illustrates the well-worn maxim that sanitation pays, while it also indicates the difficulties that arise in port sanitary work. The fruit, which weighed about 60 tons, came from the Pacific, and was stowed near the boilers in two holds whose ventilation should have kept the temperature down, but bad weather hindered ventilation, and on arrival in December a large number of the tins were found blown (that is bulged) and containing hydrogen; some were even burst. Others, outwardly sound, were found on opening to have their contents darkened and to contain tin in amounts varying from 0·2 to 2·7 grains to the pound, suggesting prolonged heating to 149° F. at least. Which of the tins were thus decomposed could only be decided after individual opening and so the whole consignment had to be condemned. As the consignees objected, this involved two attendances of a magistrate, who confirmed the decision of the medical officer. Claim was then made for return of customs duties already paid, so the tins had to be destroyed under the supervision of both customs and port sanitary authority. Destruction proved difficult. The tins could not be burned, and to dump them at sea was expensive. In this difficulty the Ship Canal Company came to the rescue, allowing the whole to be buried in their sludge dump, where the tins were at last sunk out of sight in May, and got rid of. Want of sufficient ventilation in the vessel's holds thus gave six months of trouble to Manchester officials. As it also caused loss to owners and underwriters, we may expect improvement after so clear a demonstration that sanitation saves money.

MONAGHAN COUNTY HOSPITAL.—This institution, housed in what was formerly a jail, is to be replaced by a modern building, built largely out of sweepstake funds.

ANNUAL REPORTS OF MEDICAL OFFICERS OF HEALTH

THE following are 1931 statistics of two county boroughs, two boroughs, and one urban district.

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 live births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality in childbirth.
Walsall .. (104,100)	19·5	11·3	1·03	1·15	2·0	2·2	74/35	24	2·9
West Bromwich (82,160)	20·7	12·1	0·80	1·28	2·8	2·0	86/31	38	4·7
Colchester .. (45,090)	15·0	11·5	1·06	1·66	1·3	2·1	48/—	26	0·0
Stafford .. (29,430)	11·8	11·5	0·71	1·18	1·9	2·0	63/34	29	5·7
Weston-super-Mare .. (27,310)	9·8	13·2	0·58	1·83	1·6	2·6	52/—	—	1·05

Registered stillbirths per 100 live births: Walsall 3·8, West Bromwich 4·5, Colchester 3·5, Stafford 5·2, Weston-super-Mare 4·5.

Walsall

Dr. J. A. M. Clark states that the borough extension on April 1st, 1931, added an area of 1297 acres and a population of 820 persons, and increased the number of houses lacking a piped supply of water and sewerage provision. The water from seven wells was analysed during the year, and five showed evidence of sewage pollution, while two were unsatisfactory. Of three springs examined, the water of one showed sewage pollution, and of another was unsatisfactory. As it is impracticable at present to supply the houses concerned from the public water-supply, the users of the water have been advised to boil it before use. Much attention has been given to checking the pollution of rivers and streams during the year. Two considerable sewerage schemes are in hand. There are over 4000 water-closets which have to be flushed by bucket. Rapid progress is being made in the substitution of bins for ashpits. Progress is being made with slum clearance, and a scheme covering 176 dwellings with a population of 937 is in hand.

There are now four hospitals under the control of the council, managed by three entirely separate committees. Dr. Clark indicates that effective coördination is lacking, and that his duties as principal medical officer to the public assistance committee are nominal only. The Manor Hospital (ex-poor-law) remains under the control of the public assistance committee. The admissions have increased from 1514 in 1929 to 2402 in 1931. The surgical work has increased tenfold in the last three years, and the proportion of acute work becomes continually greater. The confinements in the maternity department numbered 136 as compared with 83 in the previous year. The maternity ward has been transferred to the old nurses' home, but the department still lacks space, and the labour room is too small. The isolation hospital, which was opened in April, 1930, has experienced another very full year, and needs the addition of another ward of 25 to 35 beds. A further proposal to erect a block of 24 beds for tuberculosis awaits the approval of the Ministry.

Dr. Clark has much to say in praise of the new specially built infant welfare centre, situated in the middle of one of the housing estates, which was opened by the mayoress in June. The maternity and child welfare hospital has ten beds, and the demand far exceeds the accommodation provided. Out of the 150 infant deaths, 47 were recorded as due to pre-

maturity, and Dr. Clark is at a loss to account for this high proportion, seeing that the rate for stillbirths is comparatively low. The first antenatal clinic was established in 1928, and the work has steadily increased. The first noticeable decline in the prematurity death-rate occurred in 1930. During 1931 the total births were 2034, and the new cases attending the four antenatal clinics numbered 619. No adequate provision has been made for the dental treatment of the motbers. The immunisation of children against diphtheria is being continued at the schools and welfare centres; 691 children were treated for the first time, and 921 who had been previously tested were retested. Of 573 children immunised during previous years, 76 again reacted to the test, whilst in 497 immunity had been established. During the past four years 7302 children and adults have been dealt with and 4900 immunised.

During the year a Salvation Army hostel for men was opened by the mayor. The building, formerly offices and workrooms, has been adapted for its purpose with admirable results, and provides accommodation for 120. The average number of beds occupied nightly is 107.

West Bromwich

Dr. J. Yule reports that the dovetailing of the new functions, taken over by the department under the Local Government Act, 1929, into previously existing duties has made good progress. Hallam Hospital (ex-poor-law) has rendered excellent service during its first complete year as a municipal hospital, not only to the borough but to neighbouring authorities. It has a complete specialist visiting staff, and about half of the 474 beds are used by West Bromwich. There were no deaths from scarlet fever or diphtheria during the year. Dr. Yule complains of the great delay in the notification of tuberculosis. During 1931 the new cases examined at the dispensary numbered 175 and the new contacts 89. The efficiency of the tuberculosis department has been greatly enhanced by the increasing use of the up-to-date X ray department at Hallam Hospital, and the services of the radiologist, Dr. G. E. Dyas. Good results are claimed for the ultra-violet light treatment, the plant for which is located at the dispensary. A complete orthopædic scheme with a clinic is one of the needs stressed.

There are six antenatal clinics, which were attended by 328 new cases. The total births numbered 1698. In addition to the clinics mentioned, antenatal and postnatal clinics, conducted at the Hallam Hospital by Mr. J. S. M. Connell, F.R.C.S., the visiting gynæcologist, now form an invaluable and integral part of the maternity scheme. Mental defectives are sent to Great Barr Park colony, which is under the joint control of Walsall and West Bromwich, but there is serious difficulty in obtaining admission for low grade cases to this colony. It is hoped that the sewerage of the borough will be satisfactory for a considerable period, after the expenditure of £37,000 for new sewers at Perry Bar, and of £112,000 on the outfall works. This new work will occupy about three years. Smoke abatement is not helped by the fact that the corporation "possess chimney stacks which are not beyond reproach."

Colchester

Dr. W. F. Corfield states that the isolation hospital was of great service to surrounding districts as well as the borough. The cases of diphtheria admitted were 78, and the number of deaths was unusually large—viz., 9, giving a case-fatality of 11·5 per cent. All the deaths were due to delay in the administration of antitoxin. Three cases died on the day of admission, and in two tracheotomy was performed, but both died some days after from heart failure. There were nine notifications of dysentery, one from military quarters, four from the Eastern Counties Institution, and four from military families living in the town. No origin could be found for the military case in a sergeant's child, but the mother and two other children were found to be harbouring dysentery bacilli, and also a child in the next bed in the military hospital. All the last-named cases recovered.

Mr. Ronald Reid, F.R.C.S., has been appointed consulting surgeon to the isolation hospital. The question of admitting cases from Harwich borough and Clacton U.D., the only two districts in the Tendring peninsula which do not at present use the hospital, is under consideration, and also the proposal the the Colchester small-pox hospital should receive cases from the whole of the north of the county. At the time of writing the new maternity home was almost ready for its first patient. The staff will consist of a matron, one sister and two nurses, all qualified midwives. New patients at the antenatal clinic numbered 103, the total births being 732. It is expected that the antenatal clinic will be more appreciated when it works in direct connexion with the new maternity home.

Stafford

Dr. J. T. Macnab states that the difficulty of housing the large family with the small income is still urgent, and that the low-rented pre-war house, which often has to be demolished in an improvement scheme, is in great demand. The owners of two houses appealed to the Ministry against the charges made by the corporation for renovation work done in default. The decision of the Ministry was in favour of the corporation, the appellants having to bear the cost of the inquiry. During the first half of 1932, the Stone-road site will be completed by the erection of 52 houses, and the Stafford common committee have been approached with regard to a site on the new common for the erection of 200 additional houses. In view of the fall in the birth-rate this provision may be sufficient for present needs, but there are still a number of very badly housed families, whose cases have not been met by any of the subsidised houses. During the year the Bradford system of controlled tipping has been introduced, and its successful working has enabled the replacement of the worn-out destructors to be postponed. Recent inspections show that there are 5735 water closets with flushing cisterns and 1678 waste-water closets. The latter give rise to a great deal of trouble from the occurrence of stoppages, but only 19 were converted to water-closets with flushing cisterns during the year.

There are in the borough 112 registered milk retailers for 6807 houses, an average of one retailer for 60 houses. Dr. Macnab finds that persons who have failed at other jobs and are often far from models of cleanliness endeavour to retrieve their fortunes by starting a small milk round. Every small street is visited by several milkmen, and he thinks that with better organisation all milk could be raised at least to Grade A standard without increase in cost to the public or fall in price to the producer. At least one of the retailers of Grade A milk visits the town only on alternate days.

There is no municipal maternity home, and Dr. Macnab would like to see an annex to the infirmary provided for the purpose. The new cases at the antenatal clinic number 36, the total births being 348. Sterilised maternity outfits are supplied at cost price (3*s.* and 6*s.* 3*d.*), but up to the present there is little demand for them.

Weston-super-Mare

Dr. A. E. Remmett Weaver reports that the maternity and child welfare scheme is carried on by a voluntary association which receives an annual contribution of £135, and the help of the assistant health visitor at all sessions. The antenatal clinic was attended by 58 new cases, the total births being 267. There is no maternity home or hospital in the district. At a meeting of the local medical profession it was decided that if the voluntary hospital were to admit antenatal cases for observation and complicated maternity cases for confinement, and if septic maternity cases were received in the isolation hsopital, no

further institutional accommodation for maternity cases in Weston-super-Mare would be required. The voluntary hospital has agreed to accept these cases without charge until they have had experience of the effect of such admissions on their finances. Maternal mortality in Weston is a good illustration of the fact that one cannot judge the maternal mortality of a district with a small population for single years. During the ten years 1921–30 there were no maternal deaths from puerperal sepsis, and only nine from other puerperal causes, giving a total maternal mortality of 2·84 per thousand live births, as compared with 4·08 for England and Wales. During the ten years 1922–31, however, the maternal mortality in Weston was 3·92 as compared with 4·10 for England and Wales.

The inadequacy of the isolation hospital (18 beds) has been under consideration since the end of the war. Plans and estimates were submitted to the county council, but the health committee deferred consideration of the scheme.

PORT SANITARY AUTHORITY

Hull and Goole

IN his first report for 1931 to the port sanitary authority, Dr. Nicolas Gebbie states that 7094 ships from abroad arrived in the area, 5869 coastwise; 373 were inspected by a medical officer, 6939 by sanitary inspectors, a certain number coming in for double inspection. The total expenditure of the authority was £5150 of which £2114 was chargeable to the rates, four-fifths to Hull, one-fifth to Goole. The main inward trade was in provisions and oil, both vegetable and mineral. Water-supply for shipping is from deep wells and taken from water boats or hydrants on the dock-side; the 13 water boats were frequently inspected. The water storage tanks of 57 vessels required cleaning; of 22 samples of water from ships' tanks, only one had definite bacteriological (but undisclosed) evidence of contamination. No important infectious disease prevalence occurred. Of 53 cases of venereal disease discovered through inquiry on arrival, 41 attended the clinic in Mill-street. Rats totalling 8238 were destroyed; 6928 (all black) on ships, 1310 ashore (two-thirds brown). As to crew spaces, defects of original construction existed on 4 per cent. of the British, on 20 per cent. of the foreign ships examined, 230 (nationality unstated) had no water-supply to the crews' water-closets and 3 had no w.c. for them at all; defects by wear and tear were 912, slightly more numerous on foreign ships; nuisances by dirt and vermin were more prevalent on British ships, verminous bunks were "fairly numerous," 106; 1403 dirty and old beds were burned on board vessels. The 1403 beds were the straw-filled beds issued to seamen in many "tramps," and are constantly burned at end of voyages as the men leave. It is not stated whether all the 1403 came from British ships. No infectious cases were reported from any of the 863 canal boats. In the course of food inspection, over five million packages were examined, and 122 tons of fruit, 31 tons of shell-fish, 3 tons of wheat, and 1 cwt. of meat were declared unsound. Total aliens arriving at the port were 3627, none were rejected (certificated), and the standard of cleanliness of transmigrants is generally high.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 27TH, 1932

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 13 (last week 17); scarlet fever, 1038; diphtheria, 639; enteric fever, 53; acute pneumonia (primary or influenzal), 380; puerperal fever, 34; puerperal pyrexia, 93; cerebro-spinal fever, 24; acute poliomyelitis, 16; acute polio-encephalitis, 2; encephalitis lethargica, 10; dysentery, 15; ophthalmia neonatorum, 90. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 30th-31st was as follows:—Small-pox 22 under treatment (last week 21 and 3 under observation); scarlet fever, 1087; diphtheria, 1231; enteric fever, 12; measles, 442; whooping-cough, 422; puerperal fever, 21 (plus 8 babies); encephalitis lethargica, 229; poliomyelitis, 3; "other diseases," 112. At St. Margaret's Hospital there were 16 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In 117 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 17 (2) from measles, 3 (0) from scarlet fever, 23 (6) from whooping-cough, 16 (1) from diphtheria, 77 (24) from diarrhœa and enteritis under two years, and 12 (1) from influenza. The figures in parentheses are those for London itself.

The deaths from diarrhœa were 32 more than in the previous week and were widely distributed over the country, the highest figures being Manchester 6, St. Helens 5, Leeds 4, Liverpool and Nottingham each 3. There has now been a clear quarter without the report of a death from small-pox. The fatal case of enteric fever occurred at Barking. Three of the deaths from measles were reported from Liverpool, 2 each from Gateshead, Newcastle-on-Tyne, Wigan, and Birmingham. Leeds and Sheffield each reported 3 deaths from whooping-cough. Diphtheria claimed 3 victims at Liverpool, 2 each at Croydon and Manchester.

The number of stillbirths notified during the week was 246 (corresponding to a rate of 36 per 1000 total births), including 29 in London.

MEDICAL NEWS

Royal Faculty of Physicians and Surgeons, Glasgow

At a recent meeting of the Faculty the following were admitted to the Fellowship: Thomas Symington Macaulay and Gopal Das Malhoutra.

Paddington Medical Society

A meeting will be held on Sept. 13th at the Great Western Royal Hotel, Paddington, at 9 P.M., when Dr. Frederick Dillon will read a paper on early signs of mental disorder and some practical difficulties connected therewith from the point of view of the general practitioner.

Nordrach-on-Dee Sanatorium

This sanatorium, at Banchory, is in liquidation, and the property is in the market. The site was chosen in 1899 by a committee of professors of medicine of the four Scottish universities, and this was the first specially built sanatorium in Scotland. It stands in 25 acres of grounds in a sheltered clearing among the pines, 400 feet above sea-level.

St. Mary's Hospital Medical School

The week-end post-graduate course will be held this year from Sept. 30th to Oct. 2nd. The morning session each day extends from 10.15 to 12.45, during which three lectures will be given. On each of the afternoons of Sept. 30th and Oct. 1st two lectures will be held between 2.15 and 4 P.M. The morning lectures on Sept. 30th will be on phlebitis, backache in women, and chronic affections of the appendix and gall-bladder, by Mr. A. Dickson Wright, Mr. Aleck Bourne, and Sir William Willcox. In the afternoon Mr. Leslie Williams will speak on anæsthesia and analgesia in obstetrics, and Dr. T. C. Hunt on some recent methods of treatment. On Oct. 1st Mr. Herbert Tilley will speak on purulent nasal discharges, Dr. Robert Hutchison on pink disease, and Dr. Reginald Miller on school problems in private practice, in the morning; while in the afternoon Dr. S. Vere Pearson will discuss modern developments in sanatorium treatment, and Mr. T. G. Stevens the causation and treatment of maternal injuries in childbirth. Sunday morning will be devoted to lectures on prostatic problems, by Mr. R. M. Handfield-Jones; the treatment of *B. coli* infections by a ketogenic diet, by Dr. C. M. Wilson; and some controversial points about appendicitis, by Mr. V. Zachary Cope. These meetings are open to all medical practitioners, without fee.

The annual dinner of past and present students will be held on Friday, Sept. 30th, at 7.30 P.M., at the Trocadero Restaurant. Sir Joseph Skevington will be in the chair.

King's College Hospital Medical School

On Oct. 1st, instead of the usual opening ceremony and inaugural address, an "intensive post-graduate course" will be held. Between 2 and 5.30 P.M. on that day a series of short lectures and demonstrations will be given, with half an hour's interval for tea at 4.30. The provisional programme is as follows: 2 P.M., Treatment of Coli Bacilluria and Pyelitis, by Mr. Yates Bell; 2.30, Asthma and Desensitisation, by Dr. J. L. Livingstone; 3.15, Practical Points in Gynæcological Cases, by Mr. W. Gilliatt; 3.45, lecture-demonstration, by Mr. Cecil Wakeley and Mr. H. L. C. Wood, on Injection Treatment of Varicose Veins; 5.0, Felton's Antipneumococcal Serum, by Dr. Douglas Firth. During the afternoon a demonstration of blood transfusion methods will be held in the pathological laboratory, and, between 3 and 4, Mr. John Everidge will give a lecture-demonstration in an operating theatre on the electro-coagulation treatment of enlarged prostate.

The post-graduate lectures, held last year at 9 P.M. on Thursdays, will be resumed this session, the first being on Oct. 13th, when Dr. Wilfred Sheldon will speak on Nervous Habits in Children. Subsequent lectures will be announced in our Medical Diary. These lectures are free to medical practitioners and to final year students of King's College Hospital.

The annual dinner of past and present students will be held on Oct. 1st, at 7.30 P.M., in the Connaught Rooms. Dr. Godfrey de Bec Turtle will preside.

Fellowship of Medicine and Post-Graduate Medical Association.

Two afternoon courses will take place from Sept. 12th to 24th: at the Infants Hospital in diseases of infants, and at the Royal Eye Hospital in ophthalmology. Other courses during September and October include medicine, surgery, and the specialties at the Westminster Hospital (Sept. 19th to Oct. 1st), Metropolitan Hospital (Oct. 3rd to 15th), and the Miller Hospital (Oct. 17th to 29th); dermatology at St. John's Hospital (Oct. 3rd to 29th); oto-rhino-laryngology at the Central London Throat, Nose, and Ear Hospital (Oct. 3rd to 29th); proctology at the Gordon Hospital (Oct. 3rd to 8th); diseases of the chest at the Brompton Hospital (week-end, Oct. 8th and 9th). A series of lectures on renal disease will be given on Tuesday afternoons at the house of the Medical Society of London, at 4 P.M., for Members. A week-end course in rheumatism will be given at Bath on Oct. 1st and 2nd. A course of evening lecture-demonstrations on physical medicine will be given at the London Light Clinic on Mondays and Wednesdays from Oct. 3rd to 27th, and an evening course of demonstrations on rheumatism will be held by the British Red Cross Clinic on Tuesdays and Thursdays from Nov. 8th to 25th. A week-end course in obstetrics will be given at the City of London Maternity Hospital on Oct. 29th and 30th. Further particulars may be obtained from the secretary of the Fellowship, 1, Wimpole-street, London, W.

Appointments

Certifying Surgeons under the Factory and Workshop Acts: SIMPSON, J. B. (Newmilns District, Ayr).

London County Council: CARVER, JAMES, M.B. N.U.I., F.R.C.S. Eng., medical superintendent, St. George-in-the-East Hospital, promoted medical superintendent, St. Mary Abbots Hospital, in place of Dr. A. Remington Hobbs, deceased.

Vacancies

For further information refer to the advertisement columns

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.

All Saints' Hospital, Austral-street, West-square, S.E.—Res. H.S. At rate of £100–£150. Also Hon. Anæsthetist.

Bangor, Caernarvonshire and Anglesey Infirmary.—Jun. H.S. £100.

Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.

Birkenhead General Hospital.—Cas. O. At rate of £100.

Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.

Cardiff Royal Infirmary.—Hon. Asst. Ophth. H.S.

Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall, Gt. Barrow.—H.P. At rate of £100.

Children's Hospital, Hampstead, College-crescent, Swiss Cottage, N.W.—Res. M.O. At rate of £100.

Colchester, Royal Eastern Counties' Institution, &c.—Res. Asst. M.O. £350.

Derby, Derbyshire C.C.—M.O. £600.

Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Asst. Radiologist for X Ray Dept. £100. Also Hon. Clin. Assts.

Fareham, Hants, Knowle Mental Hospital.—Second Asst. M.O. £550.

Glasgow Eye Infirmary.—Res. Asst. H.S. £150. Also Anæsthetist. £100.

Gloucester, Gloucestershire Royal Infirmary, &c.—H.S. At rate of £150.

Halifax Royal Infirmary.—Third H.S. £150.

Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—Cas. Surg. O. for Out-patient Dept. At rate of £100.

Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and H.S. Each at rate of £100.

Hospital for Women, Soho-square, W.—Res. M.O. At rate of £100.

Ipswich, East Suffolk and Ipswich Hospital.—H.S. £120.

Kendal, Westmorland County Hospital.—H.S. At rate of £200.

Leeds, Jewish Herzl Moser Hospital, Leopold-street.—R.M.O. £200.

Leeds University.—Part-time Lecturer. £400.

Leicester Royal Infirmary.—Two House Surgeoncies. Each £125.

Liverpool, Walton Hospital, Rice Lane.—2nd Sen. Asst. Res. M.O. £350.

London Lock Hospital, 91, Dean-street, W.—Surg. Reg. £100.

London Lock Hospital, 283, Harrow-road, W.—Res. M.O. At rate of £175.

National Hospital, Queen-square, W.C.—Hon. Dental Surgeon.

Newcastle General Hospital.—Part-time Surg. Reg. £250.

Newcastle-upon-Tyne Hospital for Sick Children.—H.P. Sen. and Jun. H.S. Each at rate of £100.

Oldham Royal Infirmary.—H.S. At rate of £175.

Oswestry, Shropshire Orthopædic Hospital, &c.—H.S. At rate of £200.

Portsmouth, Royal Hospital.—Sen. H.S. At rate of £175. Also H.P., Two H.S.'s and Cas. O. At rate of £130 and £100 respectively.

Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.—H.S. At rate of £75.

Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100. Also Ophthalmic Surgeon.

Royal Institute of Public Health, 23, Queen-square, W.C.—Asst. Bacteriologist.

Royal National Orthopædic Hospital, 234, Gt. Portland-street, W. H.S. At rate of £150.

St. Helens County Borough.—Asst. M.O.H. £500.

St. Helens Hospital.—H.S. £200.

St. John's Hospital, Lewisham, S.E.—Res. H.S. At rate of £100.

St. Leonards-on-Sea, Buchanan Hospital.—Sen. and Jun. H.S. At rate of £175 and £125 respectively.

Salford Royal Hospital.—Two H.S.'s to Special Depts. Each at rate of £125.

Scarborough Hospital and Dispensary.—Two H.S.'s. Each at rate of £175.

Sheffield Royal Infirmary.—Asst. Aural and Ophth. H.S. At rate of £100.

Southend-on-Sea General Hospital.—Hon. Physician to Electro-Therapeutic Dept. Also Res. H.P., H.S. and Cas O. Each at rate of £100.

Taunton, Taunton and Somerset Hospital.—H.S. At rate of £100.

Walsall General Hospital.—H.P. and Res. Asst. Pathologist. At rate of £150.

West Bromwich, Hallam Hospital.—Temporary Res. H.P. At rate of £200.

West Bromwich and District General Hospital.—Cas. H.S. £200.

West Ham County Borough.—Part-time Medical Practitioner for Maternity and Child Welfare Work. 1½ gns. per session.

West London Hospital, Hammersmith-road, W.—H.P., Three H.S.'s, and Res. Anæsthetist. Each at rate of £100.

Westminster Hospital, S.W.—Medical Registrar. £150.

Wolverhampton, Royal Free Hospital.—H.S. for Ear, Throat, and Nose Dept. At rate of £100.

Worcester General Infirmary.—Pathologist. £400.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Westminster (County of London) and Westbury-on-Trym (County of Gloucester).

Births, Marriages, and Deaths

BIRTHS

THORNTON.—On August 29th, at "Lisnanagh," Forest Row, Sussex, the wife of G. Kennedy Thornton, M.B., of a son.

WHITE.—On Sept. 2nd, at Green Trees, Bassett, Southampton, the wife of Herbert Oakley White, M.R.C.S. Eng., L.R.C.P. Lond., of a son.

MARRIAGES

CORMACK—BARRY.—On Sept. 1st, at Holy Trinity Church, Ayr, Robert Cormack, F.R.C.S. Edin., of Ayr, to Margaret Euphans, daughter of Mr. and Mrs. Kenneth Wolfe Barry, of Chelsea, London.

GIBSON—ORR.—On August 31st, at St. Saviour's, Walton-place, S.W., Beale Hepburn Gibson, M.R.C.S. Eng., L.R.C.P. Lond., to Mary, daughter of Commander H. J. Orr, R.N., and Mrs. Orr.

SHERIDAN—SPRAWSON.—On August 13th, at Ootacamund, South India, Captain Arthur Manus Sheridan, M.B., Ch.B. Glasg., I.M.S., to Theodora, daughter of Major-General C. A. Sprawson, C.I.E., V.H.S., I.M.S., Surgeon-General with the Government of Madras.

DEATHS

BARRON.—On August 30th, suddenly, at Redlynch, Burnham, Somerset, Thomas Walter Barron, M.A., M.B. Camb., aged 81.

LOUGHNAN.—On Sept. 1st, at New Milton, Hants, Michael Loughnan, L.R.C.P.I. & L.M., L.R.C.S.I., formerly of Rathmullen, Co. Donegal, in his 85th year.

STOTT.—On August 31st, at St. Andrew's-place, Lewes, Hugh Stott, J.P., M.R.C.S., L.R.C.P., D.P.H., Medical Officer of Health for East Sussex, aged 74.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

MEDICINE AS AN ART

BY M. O. RAVEN, M.D., M.R.C.P.

WE are all of us accustomed to be reminded by our elders when we have been endeavouring to base conclusions on observed phenomena, that medicine is an art as well as a science. To the young and enthusiastic in any department of medicine this seems merely a time-honoured platitude, reiteration of which is the more irritating because the response of patients to the scientific attitude is often disappointing. It is a common experience that a hard-won and well-proved diagnosis may be rejected in favour of a sympathetic verdict which is quite meaningless. A ventricular trigeminal pulse, for example, does not impress the patient nearly as much as the assurance that he has a "tired heart." After a few years' experience of what the public really wants, it is hardly surprising that an attitude of compromise between the scientific index-finger and the vaguer generalities of speech enters into the manner in which a doctor faces the questions of his patients. It becomes clear that patients demand something more than a hard-and-fast physical diagnosis which they may be unable to understand, and that it is necessary to treat not merely the defective organ, but the patient as a person. And thus the doctor begins to realise something which has apparently been unteachable in hospital, and accepts medicine as an art.

THE PATTERN OF A MIND

Now, in the case of a work of art, whatever intellectual interest we may be able to find in its appreciation, the essential interest is an emotional one, elicited by a recognition in ourselves of something set forth by the artist. The artist shows us his mind, and his technical skill in doing so is a secondary affair. Indeed, it is an essential quality of one who practises an art to transfer his mental experience into other minds through whatever medium he happens to use. Thus it may be worth inquiring in what way doctors who regard medicine as an art demonstrate this quality. If one considers the medium—whether poetry, music, architecture, painting—through which artists work in order to project their minds into the minds of others, it will be found that it always has something which we can call "pattern." Similarly, normal people, who do not come under medical care, may be said to have a fairly normal pattern in their lives; it may not be an exciting pattern, but it is a good enough one for them. People who come to consult doctors, on the other hand, are aware that their lives are in some way being upset. In so far as we deal with them scientifically we treat them as objects of rational diagnosis and of rational or empirical treatment; but when we get beyond this relatively simple sphere of management we automatically fall back upon our art. It is then upon the way in which *we* behave to them, not so much upon how *they* react, that the restoration of their physiological and psychological pattern depends; the patient's personality becomes our canvas. The pattern which we leave there will correspond to some extent upon the pattern already existing in our own minds. To give a concrete example: if a doctor believes that most indefinite human ills can be attributed to intestinal poisoning, we shall find in his patients people whose interest is to a large extent centred in the frequency of their motions and the odour and reactions of their fæces—not a pattern which we should choose for any life that was dear to us. Or again, if he believes that most indefinite ills are due to sexual causes, he is liable to produce in the minds of his patients an introspective sexual outlook on life, which he could certainly never choose to produce in a member of his own family. One may see patterns of all kinds in the lives of patients whose troubles are not due to purely physical illness—e.g., patients whose bathrooms are stored with every recently advertised patent drug. Incidentally, I know a doctor who files the advertisement of every patent drug sent him and tries each for two years; one may wonder about the outlook his patients acquire and the consequent patterns of their lives. What I would like to suggest is that before the doctor begins to apply treatment to these cases, in which the physical indications are not fairly obvious, he should consider to what extent the general patterns of their lives are being upset by the symptoms of which they complain, and to what extent he himself, with his particular predilections and prejudices, is likely to be able to change the pattern without damaging it further.

TWO GROUPS OF MEN

People in general, including doctors, may be divided into two groups. We all recognise the people who believe that by action they can influence the world around them—the people who are apt to leap before they look—and those others who believe (like Hamlet) that they must have sufficient grounds before they act, and are characterised as people who cannot make up their minds. On the group to which we ourselves belong will largely depend our attitude towards our patients, and consequently the effect we have upon their lives; but it is important to recognise that the man of action will not have the desire and therefore not the opportunity to study the mind of his more tardy opposite, whereas the introvert will have great interest in the mind of the man of action. The man of action selects his weapons with confidence, and applies himself to the service of his patients, often with great success, but, made as he is, he is not interested in what he rather contemptuously calls the patient with nerves, unless he can persuade himself that there is a definite physical cause to which he can apply his energies. His simplest plan is to find a course of treatment which will satisfy his mind and that of his patients that *something* is being done for them; but, as we know too well, the benefit of every new departure is liable to cease when its effect on the patient's mind has worn off, and some new gesture is required. The man of action finds it difficult to treat successfully patients with "nerves," and to restore them to normal and active life.

THE AVOIDANCE OF MENTAL WARFARE BETWEEN DOCTOR AND PATIENT

The psychologists have done a great service in endeavouring to define the normal pattern of a man's or a woman's life—the various stages through which they pass, how they are at one stage tied to the mother, at another to the father, at another to the companion at school. While it is a matter of common sense to see how this man or that woman has been deprived of certain influences upon the pattern of their lives—e.g., the boy who has never been sent to school, or the only child who has never grown away from parental influences and never acquired initiative—it is much harder to trace these effects in the minds of neurotics, where the whole personality has got overlaid with quasi-physical symptoms, and tragic events have passed into the unconscious.

There is much scepticism upon the efficacy of any psychological methods among practitioners who are primarily men of action (or extraverts as some prefer to call them). While no practitioner can be expected to acquire the technique of unravelling intricate psychological threads, he should be able to acquire a sense of his patients' difficulties, of the spoiled patterns of their lives, and to try to help them. It is difficult to believe that any purely "nervous" state can be permanently helped by physical suggestion; symptoms can be temporarily ameliorated by sedative drugs, but, for example, as Dr. Crichton Miller has pointed out, hypnotics, while

they may promote sleep, do nothing to cure insomnia, which is the outcome of some maladjustment of the mental pattern of the patient. The type of doctor whom we may for want of a better word call the introvert, when approaching a patient with nerves, will endeavour to help him to think straight and to unravel the complexities of his mind; the extraverted doctor, on the other hand, will advise him either to get busy with some useful occupation, or, if that be impossible, to have an impressive type of rest treatment like the Weir Mitchell.

Whichever line of approach is made to a patient with nervous derangement, it must be made in a spirit of coöperation. It is a worse than useless beginning to try to impose our own individual views upon the patient by what may lead to a kind of mental warfare; on the contrary, a search must be made for points of mental affinity between the doctor and the patient; where, as may rarely be the case, there are no such points discoverable, there is likely to be a marked mutual irritation between the two—not necessarily the fault of either—and in such circumstances a wise man will admit his failure and advise the patient to go to a differently minded type of person from himself.

Specialists, of course, are people who have voluntarily allowed their minds to take on a certain pattern of thought: the bacteriologist sees infection as the governing principle of morbid symptoms, the gland specialist thinks in terms of endocrine derangement, and even the cardiologist may consider his task complete when he has detected or excluded electrocardiographic abnormality. Specialists, at least those who see no patients except those referred to them by doctors, do not impress their personalities upon patients as do general practitioners. For this reason, among others, practitioners should use specialists to elucidate certain points, but should never, even when asking the help of the psychological specialist, hand over the general management of the patient's life to him, for this is a responsibility which cannot properly be delegated.

It must never be forgotten that medicine is still an extremely inexact science, with certain refreshing exceptions. We do not know why one case of pulmonary tuberculosis will go steadily downhill from the start, while another, diagnosed comparatively late, will develop a life-saving fibrosis; nor can we foretell that one primipara will have a baby in two hours and another only in two weeks. Consequently, where we get to cases where genuine scientific data are few or absent, we should expect a still greater irregularity in the course they run and in our prognosis; and it is here, of course, that we fall back unconsciously upon what is termed the art of medicine. And although, like other arts, the best work is no doubt done instinctively, yet there is much to be learned from getting to know what sort of people we are dealing with in each case. This art is required to a large extent even when there are definite physical indications. Can we type our patients also in respect of their mental pattern? I think we can, so long as we have patience with people whose psychological type does not happen to correspond with our own. In the first place, the extraverted and introverted types should be recognisable to some extent in most patients with good effect. It is characteristic of an introvert to brood; thus it is not of the slightest use for an extravert doctor to leave the patient with the dictum, "Don't brood." It is better for him to suggest some occupation in keeping with the sort of subjects in which the patient is in natural sympathy—for example, people disappointed of childbearing may adopt a child with great success. The introvert, it must be remembered, must be made to extravert himself, to restore the balance. A much harder problem is to get the extravert neurotic better; it is of no use to say to him, "Don't do so much," or "Rest more." Keeping still outside the limits of normal physiological rest is as wretched to him as it is to a child; in order to restore the balance the extraverts have to some extent to get introverted. Some of them find this process so uncongenial that they would rather submit to any process of physical suggestion, or even commit suicide.

I myself believe that this difficulty in getting the balance of extraversion and introversion is the main object of attack in nervous patients and in many not primarily nervous. But whereas the introvert is always in a position to learn, as it is his tendency to think, the extravert is unhappily placed, for he has no wish to change. He wants to get his own way, and to overturn anyone who impedes him; to that extent he is infantile. Such unconscious egoists have a damaging effect upon the lives around them. Where they come at mature age, as patients with nervous troubles, it is indeed a question whether the reduction of their fortress is worth the trouble to everyone involved. One is tempted to regard them as very advanced cases, whose proper treatment should have been carried out in childhood, and who are now almost past cure. Can we guess what is the central motive of the egoist? It goes by various names—jealousy, self-love, prestige, superiority complex—and to those who look to Shakespeare as a reliable guide it is found at its most terrible in Iago, in its more redeemable guise in Lear. The origin of their troubles, no doubt present to some extent in each one of us, is probably to be seen in the nursery, where a hectoring child throws his weight about at the expense of other children, and is never taught to laugh at himself. The extravert neurotic is indeed a most tragic patient, especially if he happens to have a physical ailment as well. He goes about the world seeking for a sign which shall make him whole again, and there shall be no sign given to him. The extravert believes himself to be to some extent a picked man. It is very good for us to be unpicked; this can only be done through a process which here, for consistency's sake, we may call introversion, and I believe it is much more possible for us to apply this method in some form or other to neurotics than is generally imagined. The selection of the particular form best adapted to any individual patient is one of the ways—but only one—in which the art of medicine may manifest itself. It illustrates well the conception of the art of medicine as I understand it—the art of applying to a patient the personality of the doctor, and the effect of a psychological affinity between patient and doctor upon the pattern of the life of both of them, but especially on the pattern of the life of the patient.

LIESEGANG RINGS

ABOUT thirty-six years ago Liesegang, in staining some histological material by the Golgi method, discovered that the banding phenomenon there observed was an artefact produced by the interaction of silver nitrate and potassium bichromate. He showed this by placing a drop of silver nitrate solution upon a film of gelatin containing potassium bichromate when the now familiar concentric rays of silver chromate were deposited at increasing distance from each other as their distance from the centre increased. This was the beginning of the study of the general phenomenon associated with the name of Liesegang. The subject has attracted the attention of chemists, physicists, geologists, and biologists, all of whom have sought for a common explanation of the banded phenomenon occurring in their own particular field, but, as yet, no universal explanation is forthcoming, and it may well be that otherwise similar phenomena may be brought about by a variety of causes. The ignoring of this possibility has led some authors to describe as Liesegang rings due to internal causes some forms of rhythmic banding which are clearly due to external causes—such as diurnal or seasonal changes. A large amount of literature has grown up around this subject and the bibliography at the end of a book recently published by E. S.

Hedges, D.Sc.,[1] gives 482 references. This book contains a chapter on properties of colloidal media, before discussing the Liesegang phenomenon and the theories which attempt to explain it. The two following chapters are concerned with periodic diffusion structures without chemical reaction. In this connexion it may be noted that the author objects to the description of the reactions which produce Liesegang bands as "rhythmic reactions," since there is nothing to suggest that the reactions are periodic; the periodicity is spacial, not temporal. Periodic reactions are those in which the reaction velocity varies periodically, while Liesegang bands are periodic structures. One of the most interesting chapters is that in which Dr. Hedges has assembled a motley collection of periodic structures of natural origin which are presented with the aim of helping "physical-scientists and biologists towards an appreciation of the other's point of view." The book is the first one in the English language devoted to this curious phenomenon.

CHOLERA IN SHANGHAI

Dr. Wu Lien Teh's account[2] of the cholera epidemic in Shanghai in 1931 is of special interest owing to the fact that it was only in July, 1930, that the Chinese National Quarantine Service took over the control of port health work at Shanghai from the Maritime Customs Department. A precedent for this change existed in the post office, which also was originally administered by the customs authorities, but was transferred to the national postal department in 1911. It is said that great developments have occurred in the latter instance, and Dr. Wu is able to show that much progress has similarly been made in sanitation and quarantine arrangements in the short period since the new government department, of which he is the head, came into being. The transfer of control, he says, has been effected smoothly and satisfactorily, and the customs authorities and representatives of shipping interests, many of whom of course are Europeans, have rendered every support and assistance. To form a purely Chinese administration of this kind in earlier times would have been impossible, but in the last 30 years a new generation of doctors has come into existence, many of whom have studied in the best colleges of Europe, America, and Japan, as well as China. The Ministry of Health had the assistance of Dr. C. L. Park, head of the quarantine service of Australia, and chief of the epidemiological division of the health section of the League of Nations, in drawing up their new regulations. China has ratified the international sanitary convention of Paris, and every effort has been made to keep abreast of the times, and to reconcile the different and often conflicting interests of an international port.

Cholera occurs to some extent in Shanghai every year but, judged by Indian standards, few of the epidemics have been really serious. The chief significance of the outbreaks has lain in the importance of the port from the shipping point of view. The population of Shanghai in 1931 is given as 3,027,419. In the last ten years the worst epidemic, that of 1929, accounted for 3571 cases, with 313 deaths, and in 1924 only 12 cases occurred. In 1931 there were 482 cases, with 57 deaths. Noteworthy features were the diffuse nature of the outbreak, the foreign concessions showing almost as great a percentage of cases as Greater Shanghai, and the low death-rate, which only amounted to 11·8 per cent. Extensive floods occurred in the Yangtze valley in the autumn, and many refugees were assembled in camps, where things would have been much worse if early precautions had not been taken against the disease. With regard to the origin of the epidemic, Dr. Wu is of opinion that the densely populated Shanghai district must now be regarded as an endemic area, although attention should be directed to the old and crowded city of Ningpo, only one night's journey by steamer, where infection has been known to exist for centuries. On the present occasion the precaution was taken of inoculating the crews and passengers of all vessels coming from Ningpo. In the Shanghai area, the three sanitary authorities—those of the International and French concessions and Greater Shanghai—coöperated to carry out prophylactic measures. Extensive campaigns of propaganda were initiated, enlisting the help of scouts and guides, and inoculation was pressed. Apparently there is little objection on the part of the Chinese to inoculation. Cases were investigated, wells disinfected, and supplies of medicine issued free to the sick. Where the water-supply was known to be defective public artesian wells were opened. In the whole area 761,279 inoculations were performed; it is stated that of the 482 persons attacked by the disease not one had been inoculated.

OPEN-AIR AND COVERED SWIMMING POOLS

GOVERNMENT assistance to local authorities has encouraged the provision of public bathing pools during the past few years. Mr. H. R. Austin, writing in *Municipal Engineering* of Sept. 1st, mentioned the large number of authorities who have limited their schemes to the construction of open-air pools. Bathing in the open air is undoubtedly much more pleasant than bathing in an enclosed swimming bath, but our climate makes it a luxury to be enjoyed rarely, except by the hardiest; this at least appears to be the usual experience of bathing pool authorities. Mr. Austin considers that in an urban community the swimming bath should have "a definite place (*a*) as a centre for physical training of a special kind, and (*b*) as an area for exercise, recreation, and sport." To fulfil these functions he thinks that the bath should be in use during the day for the instruction of school-children in swimming, and during the evening there should be opportunity for both sexes to practise. It is impossible to carry out this full programme in an open-air bath all the year round. It is true that six hot days in the year will bring in a revenue from an open-air bath which makes a fair showing in the annual accounts, but this does not mean, necessarily, that it meets the needs of the district. Mr. Austin thinks that the solution lies in providing a comparatively small covered pool which can be used all the year round, in a central position, and a large open-air bath which could accommodate hundreds on infrequent occasions. It should not be beyond the ingenuity of those concerned to devise a swimming bath with a sliding roof, or when the pool is in pleasant surroundings, with detachable walls on the south and west sides, so that in really warm weather the swimmer can have the added amenities which make open-air bathing immeasurably more attractive than a plunge in a closed swimming bath, however well devised.

[1] Liesegang Rings and other Periodic Structures. By Ernest S. Hedges, D.Sc. Lond., M.Sc., Ph.D. Manch., A.I.C., late Darbishire Fellow of the University of Manchester. London: Chapman and Hall, Ltd. 1932. Pp. 122. 10*s*. 6*d*.

[2] Reports of the National Quarantine Service, Series II. Edited by Wu Lien Teh and Wu Chang Yao. National Quarantine Service, Shanghai.

Medical Diary

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 12th, to SATURDAY, Sept. 17th.—INFANTS HOSPITAL, Vincent-square, S.W.1. Every afternoon. Course in Diseases of Children. Lectures and demonstrations.—ROYAL EYE HOSPITAL, St. George's-circus, S.E. Every afternoon. Course in Ophthalmology, lectures and demonstrations.—(Courses open only to Members of the Fellowship.)

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Sept. 9th.—4 P.M., Mr. N. Asherson: Indications for Operating on the Mastoid.

FRIDAY, Sept. 16th.—4 P.M., Mr. A. Lowndes Yates: Emergency Operations in the Throat, Nose, and Ear.